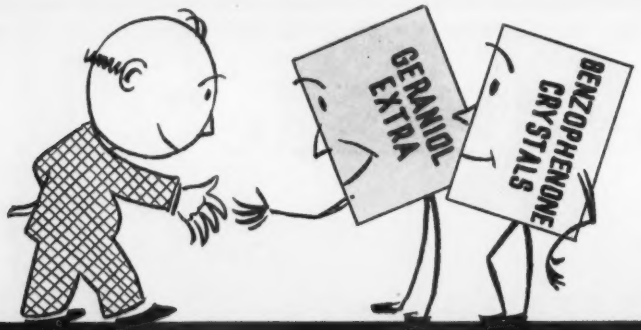
Vol. VIII, No. 4 66 April, 1932

SOAP

with which is included an

Insecticide & Disinfectant Section

Published by MACNAIR-DORLAND COMPANY, INC., 136 Liberty Street, New York



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Volume VIII April, 1932 Number 4

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INSECTICIDE and Disinfectant Section, which is included as a department of every issue of SOAP, begins on page 79. Oil and Fat Section begins on page 71. These sections contain news, articles and editorial opinion of particular interest to their respective industries.

«

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Published monthly on the 15th by

MACNAIR-DORLAND COMPANY, INC.

Ira P. MacNair Grant A. Dorland

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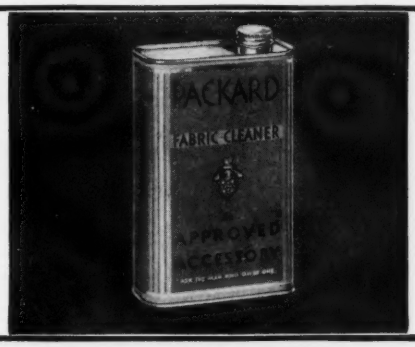

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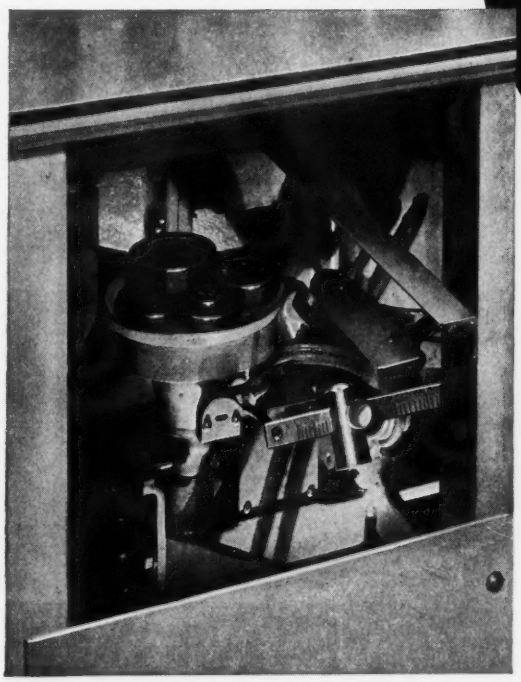

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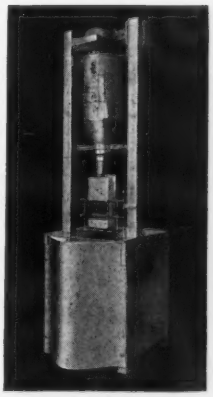

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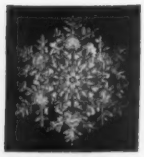

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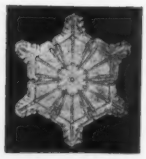

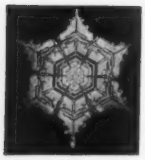

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SOAP

VOLUME EIGHT NUMBER FOUR

The Tax Hodge-Podge

OUT of a jumbled hodge-podge in Washington, a tax bill is arising. The tax program, if it may be dignified by such a title, aims to raise something in excess of a billion dollars to balance the budget of the United States Government, or at least to give the appearance of balancing the budget. "Soak the rich" is the tax program keynote. Congressmen have turned economic contortionists in their efforts to write a tax bill and at the same time convince the great mass of voters that the taxes are aimed at the other fellow. "The rich"—Heaven help 'em—are going to get it one way or the other. The quality of mercy in Washington today is strained by one thing, and one thing alone,—votes. The "rich," be they individuals or corporations with thousands of stockholders, are in the minority, and when votes are counted, minorities do not usually receive very much consideration.

It is a sad commentary on this representative government of ours that economic legislation in a time of crisis is considered primarily from the political angle and secondarily from the economic angle. Crisis or no crisis, every vote in Washington on the tax bill is cast with an eye to the elections next November. The great Congressional bluff goes on, and Congress conducts itself and votes with a view to getting itself reelected. The tax bill is no exception in the political whirlpool. A bill which purports to balance the budget is being hacked out and will be passed amid the usual puffing and spouting. Most of us will eventually survive its effects, but the experience is not going to be very pleasant.

—o—

The Position of the Renderers

THE plight of the average renderer has been no secret for many a moon. The rendering plants have been operating month in and month out at severe losses. It is estimated that for every pound of tallow being sold today, some renderer is taking a loss of a cent or more per pound. That they have been searching about for some way out, but that the means of changing losses into profits are limited, has been apparent. A considerable number have already turned to soap manufacture. A larger number are contemplating soap manufacture. The largest number, however, seems to be those who have shut down their plants or are planning to do so.

No matter what steps the renderer takes to relieve his position, the soap manufacturer is deeply concerned. It is not altogether unpleasant for the purchasing de-

partments of the soap plants to find tallow and greases kicking around the market at previously unheard of prices. But does not this unhealthy condition of the rendering industry harbor a future menace to the soapmaker? Are not the effects likely to be more immediate in the soap business than is quite generally believed?

The shutting down of rendering plants is going to be felt by the soap industry sooner or later. In spite of large stocks today, the reduction in production seems bound to make its mark eventually, even though it may take another year to do so. The chief disturbing influence of the moment, however, seems to be the movement of renderers into soap manufacture. The laundry and chip soap markets are none too strong at present. The entrance of additional manufacturers,—renderers, desperate as a result of long continued losses, and avowedly willing to do a soap business at cost,—is bound to complicate further the soap marketing situation.

Those buyers of tallow and oils who have used the strength of their positions in an abnormally weak market to keep prices depressed to as great an extent as possible, have been working, we believe, to their own ultimate disadvantage. As we see it, the soap industry will probably be the chief contributor over a period of years in paying for the present chaotic conditions among the renderers, and the chief mode of payment will not be alone in a higher price for tallow.

—o—

The Hare Bill

BY a large majority, the Hare Bill calling for the independence of the Philippine Islands, was adopted by the House of Representatives. The spirited objections of the Secretary of State were no deterrent. The "saviors" of the farm and dairy interests had their forces lined up and they rode roughshod over the opposition. That eight years, as designated in the bill, is an unusually short time to permit of proper economic and political adjustment in preparation for independence, did not seem to matter. That the cry of "save the American farmer from competition with the products of cheap Oriental labor" was the chief moving force behind the vote, was apparent. The independence of the Filipino, his right to self-government and complete freedom, were merely incidental. These latter gave the chief opportunity for a fine background of high-sounding oratory. The real object of the bill, as is quite generally known, is to cut off Philippine produce from the American market. Not that this will do the American farmer one iota of practical good,—but it certainly will make a nice showing when these Congressmen come up for reelection before their farmer-constituents next fall.

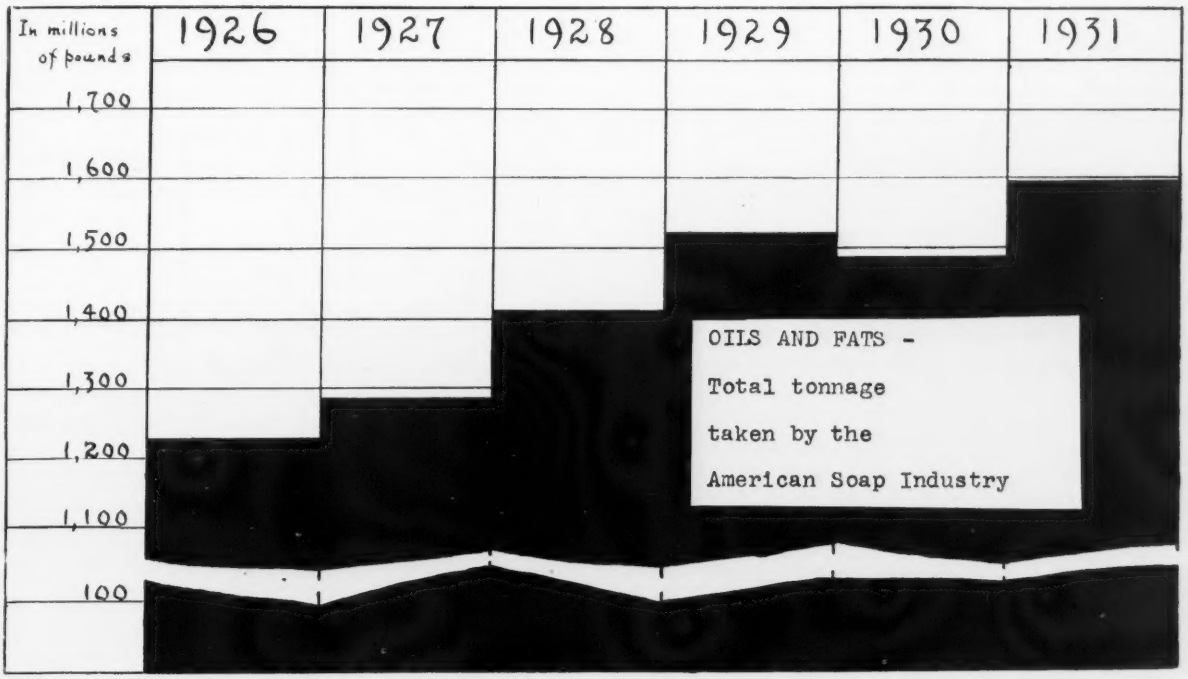
The Hare Bill is eminently unfair to every dollar of American capital which has been invested in the Philippine Islands over the past thirty odd years of American control. It will be a severe economic blow to the Islands. Further investment by Americans in enterprises there for some years to come is unlikely. The hope exists that the Senate will modify the bill to extend the time to fifteen or twenty years, instead of eight. A veto by the President seems certain in its present form.

—o—

In a message to stockholders, the president of one of the largest American chemical manufacturers pointed out that industry is striving for greater efficiency and reduced expenses, and that our governments, both national and local, should recognize the necessity of doing the same thing, and of bringing expenditures within the bounds of more moderate taxation. True! And the way is, as he suggests to make yourself perfectly clear to your Congressman and Senators that you look for this reduction in government expenditures, —and we add, *in fact* and not in the usual form of a blast of congressional hot air.

—o—

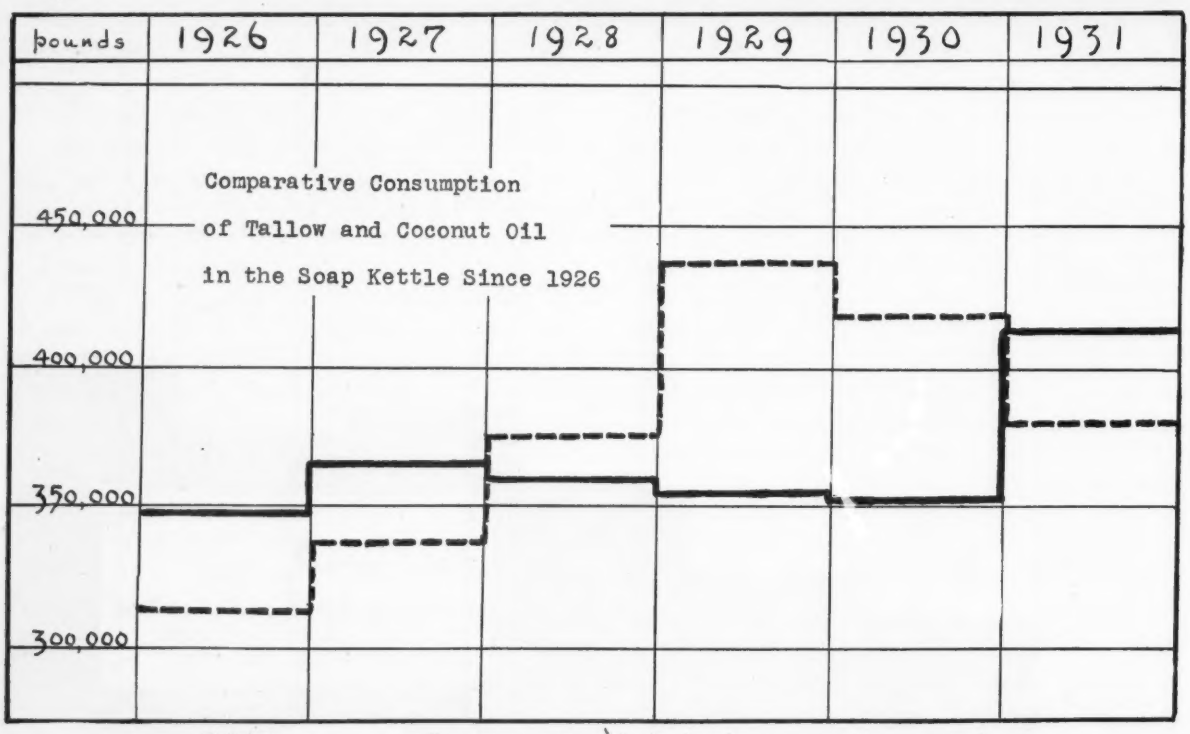
Insecticides kill through an electrical discharge, according to a paper before the American Chemical Society recently. By use of a type of radio set, the electrical current generated within an insecticide or poison will determine in advance its lethal power. Too bad that we did not know about this before all the research work was done on the biological methods and the chemical methods for determining the insecticidal power of pyrethrum. Just think, —all we needed was a radio set.



Shifting Fat Consumption In Soap Manufacture

DURING 1931, the soap industry of the United States consumed approximately one and a half billion pounds of various oils, fats, and greases in the production of something near to 3,500,000,000 pounds of soap and soap products. These figures represent the maximum of a steady increase over the previous five or six years, fat and oil consumption, or rather available in the soap plants, for soap making moving up from about 600,000 tons in 1926 to almost 800,000 tons in 1931. Soap production has probably had a rise approximately in proportion to these figures, although the 1931 total was in all likelihood actually not quite as great as would be indicated by the oil and fat consumption estimate. The oils and fats consumed in 1926 had a value which might be calculated roughly at five cents per pound and equal to about $60,000,000. The materially larger tonnage in 1931 with an average value of perhaps two cents or under was only valued at $33,000,000.

A steady shifting about of fat and oil supplies for the soap kettle is always taking place according to changes in production, supply, and market conditions. The demand for any fat or oil for the soap kettle is naturally linked up very closely with the abundance or shortage of supplies, and the resultant fluctuations in market prices. Demand from the soap kettle naturally gravitates to the oil or fat where the supply is greatest and the price lowest. However, with the limited interchangeability of oils and fats in soap manufacture, there is no unhampered movement from one oil to another. The limitations in use of the various soap fats is the factor which has much to do with restricting price movements within a single class and preventing a general leveling out of prices throughout the entire group. Where there is interchangeability of use, the fat in greatest



Solid line represents tallow consumption; the broken line represents coconut oil

supply at the lowest price naturally is in demand, and the shift of tonnage is in the direction of the fat in question and away from the fat of higher price for which the cheaper fat can be successfully substituted. The movement away from corn oil toward soya bean oil in the manufacture of potash oil soaps during the past year or two, owing to the consistently lower price of bean oil and the comparative high price of corn oil, is a typical example.

WHEN any oil or fat sells at an unusually low price for any length of time, there is an apparent increasing pressure behind that product to force it to the soap kettle where price is such an important factor. Shifting prices have induced soap makers repeatedly to revise their fat proportions even to the point of changing the characteristics of the finished soap in some instances. In the case, for example, of a manufacturer producing a regular coconut-tallow toilet soap, the tendency is, of course, to change the proportions within necessary limits according to market conditions of the two fats. During the past three years, tallow has been selling at the lowest prices in over thirty years. Coconut oil has also been selling at low prices, but not as low in proportion as tallow. Every pound of tallow which has been sold during the past year has meant a loss of a cent a pound or more to the renderers. The price has stood at 2½c per pound and sometimes lower. The pressure of this low-priced fat to the soap kettle is reflected in the use of a higher proportion of tallow and less coconut oil in the toilet soaps mentioned.

In 1929, 25 per cent of all the fat used in soap manufacture in the United States was tallow. Owing to the low price, this proportion had increased to 28 per cent by 1931. On the other hand, coconut oil in 1925, represented 31 per cent of all the fat used in soap manufacture in this country. Its comparatively higher price,—and this in spite of the fact that crushers lost money on all they produced,—swung the tide of demand away from it with the result that its proportion dropped from 31 per cent down to 26 per cent in 1931.

Where fat prices generally are low, a tendency toward an increase in demand for the higher quality fats is quite common. A refined oil or fat which can be bought under present conditions at a price which is lower than the ordinary cost of a crude grade, is to be preferred and is frequently chosen. It is not surprising that a soap maker who has been in the habit of paying six cents for extra tallow over a period of years to switch to a fancy tallow in the present market when he can buy it at three or three-and-a-half cents. The flight to the better fats leaves the lower grades with just that much less market support, and lower by correspondingly wider differentials. It was without doubt the extreme low price of grease which originally was the motivating force in sending to market the low-priced yellow laundry soaps of the past year.

IN considering the shift in fat supplies for the soap kettle, the position of rosin during the recent few years has been interesting. Today, rosin prices are low, but not quite as low as they were several months ago. In spite of the low rosin levels, oil and fat prices are down to such a degree that an N rosin, for example, at around two cents per pound is selling at a comparatively high price in competition with greases for the soap kettle. Rosin at 1½c to 2c per pound would be considered unusually low in almost any market except the present one. These prices would, under ordinary circumstances, represent a handsome inducement to the soap maker to increase the rosin proportion of his laundry soaps to the maximum. With tallow at 2½c, yellow grease around 2c, and other fats in proportion, such rosin as is used, is quite obviously not for the purpose of cutting costs to any great extent.

Several years ago when rosin was quoted at the equivalent of five cents a pound or thereabouts, the movement of the gum to the soap kettle fell away sharply. The rosin market was out of proportion with the grease market, soap makers maintained, and there was little inducement to use it except where necessary. It was pointed out then that a normal relationship for about a K or N rosin to fat prices was about half the price of extra tallow. With prices below this ratio, the proportion of rosin consumption in soap would increase; above it, the trend would be toward a reduction in the proportionate consumption of rosin. Now, with rosin prices at the lowest in years, and with what should be a heavy movement to soap makers, a complete demoralization of the grease and fat markets of the world throws what might be considered a normal ratio completely out of gear.

With the shifting about of fat supplies, such as has been possible within the limited range of fats suitable for the soap kettle, a steady increase in total consumption by soap makers has been noted over the past six years with the exception of 1930 over 1929. This so-called "total consumption" may not, however, be exactly fats or oils actually consumed. It is rather the total fat which was taken by the soap industry and which was "available" for consumption. In other words, it was in the soap plants, but whether it was all consumed or not,—particularly in 1931,—is not known.

THE following represent the approximate total consumption of fats by American soap makers, which are classed by the Foodstuffs Division of the Department of Commerce as "available for consumption":

1926	1,225,000,000 pounds
1927	1,288,000,000 pounds
1928	1,418,000,000 pounds
1929	1,520,000,000 pounds
1930	1,484,000,000 pounds
1931	1,600,000,000 pounds

The year, 1931, was marked by shifts in oil and fat consumption which are significant. The use of tallow by soap makers, or at least, the tonnage available for consumption in soaps, rose sharply in proportion to previous years. A total of 412,000,000 pounds was available as against 353,000,000 for the previous year, and against an average of about 355,000,000 pounds for the previous five years. In the case of whale oil, as might be expected after the tremendous catch of 1930-31, the amount available for consumption was more than doubled in 1931, jumping from 61,000,000 in 1930 to 139,000,000 in 1931, practically all of which was held for consumption by one soap manufacturer. Greases dropped off some ten million pounds in 1931. Coconut oil "available for consumption" in the soap kettle also dropped sharply from 419,000,000 pounds in 1930 to 377,000,000 pounds in 1931, a decline of 42,000,000 pounds. The production of crude corn oil declined more than 20 per cent in 1931. Fatty acid output was less. Cottonseed foots for soap slid down the scale twenty per cent on reduction in cotton oil output. Fish oil production jumped up sharply, more than fifty per cent.

THE following figures, prepared from the data of the Foodstuffs Division of the Department of Commerce, give in detail the shifts in oil and fat supplies during the past six years as they have directly affected the soap industry.

	Year	Total net quantity available for consumption	Amount to Soap Kettle	Percent of total available for consumption in soap
		(In Thousands of Pounds)		
Whale Oil	1926	58,860	58,860	5
Percent to soap kettle—100	1927	60,035	60,035	5
	1928	66,209	66,209	5
	1929	71,022	71,022	5
	1930	61,568	61,568	4.5
	1931	139,693	139,693	9.5

(*Turn to Page* 75)

Lathering Power of Soaps

The Factors in Its Improvement and Control

by JOSEF AUGUSTIN
Wiesbaden, Germany

FOUR main factors determine the lathering power of soaps, namely: 1. The fat mixture (charge); 2. The manner of saponification; 3. The saponifying bases; 4. Added products. There cannot be any doubt but that the fat mixture is the most important factor. It is a generally well known fact that a fat charge of coconut oil, under ordinary conditions, produces a soap of the strongest lathering power. Palm kernel oil and babassu fat which, up to the present time, has not been so well known, have about the same effect. It is true that the high lathering power of these soaps entails a greater soap consumption, due to their greater solubility in water. On account of this, quantities of these soaps when compared with like quantities of other soaps, should not be considered as having such an exceptional lathering power as may appear upon a superficial test. Finally, these soaps have the further drawback that the lather which, at first, is exceptionally great, and consists of very large bubbles, quickly disappears. There must also be mentioned in this regard the greater sharpness of coconut oil soaps and similar soaps.

In view of these considerations, the manufacturers of soaps for industrial, household, and particularly for toilet purposes, use a combination fat charge. With the addition of such oils as olive oil, sulfur olive oil, peanut oil, castor oil and of fats such as palm kernel oil, lard and mainly tallow, it is possible to equalize, to a greater or lesser extent, the rapid wasting away, quick breaking down of the lather or suds, and the sharpness of the pure coconut soaps. The fat charges customary today are the result of this aim towards equalization of the properties, and these fat charges fulfill the various demands as to lathering power in most every respect.

The manner of saponification does not influence the equalized lathering power as greatly as the fat charge. Nevertheless, strange to say, it was observed that a certain brand of cold-made toilet soap was given the preference by consumers over the same soap with the same fat mixture, but made by the boiled process. In the case of the cold-made soap, the lather was richer and at the same time more creamy. I can explain this only in the manner that in connection with cold-made soaps, there were produced from the albuminous and lecithin-like accompanying substances of the fats, soap-like products in addition to the soap proper. The products thus formed were able to modify favorably the lather in the manner explained. The increased lathering power and improved lather, therefore, seem to be due to an accompanying substance or to additions.

Of greater importance than the manner of saponification,—but, of course, of lesser importance than the fat charge,—are the saponifying bases. In actual commercial practice, the following bases are of importance: sodium hydroxide, potassium hydroxide, and triethanolamine. In spite of many experiments and tests, it could not be proven positively that potash soaps lather better than soda soaps made of the same fats. In one case, however, the difference was quite noticeable.

There were taken for washings made for purposes of comparison: 0.5 grams of a liquid potash soap (soft soap) with 30% fatty acid content, with a fat mixture of 60% coconut oil and 40% olive oil. On the other hand, there were also used 0.5 grams of a solid soda soap with a 70% fatty acid content and a similar fat charge. The lather of the potash soap was generally declared to be better and stronger. Therefore, figured on the fatty acid content, the lather of the potash soap is more than twice as great.

On the other hand, a soap made mostly of sodium oleate proved to have a greater lathering power than a quantity of potassium oleate corresponding to the same fatty acid content. In the case of potassium oleate,—obtained from oleic acid, no glycerin was present, which was also the case with sodium oleate.

A potash soap of soja oil,—on basis of the same fatty acid content,—lathered more quickly, more

strongly and more lastingly, than a soda soap made of this oil, which latter soap in practical operation, it is true, is hardly ever used. The two stearate soaps showed the same results.

A potash soap can usually stand more glycerin which, as is well known, reduces lathering power but without reducing it too greatly. If, however, we are concerned mainly with coconut-potash soap, there may still be present glycerin to the extent of one-third of the fatty acid content, without a reduction of the lathering power being too noticeable.

Potash-Soda Soap Mixtures

AN increase of the lathering power, in the case of solid soaps (i.e. soda soaps) is effected by the addition of a small quantity of potash soap. This soap may be obtained by saponification with a mixed lye. Of course, in this connection, it is not possible to determine exactly in advance the potash soap to be produced, for chance plays a great role in this reaction. Therefore, in place of potash soaps with superior lathering power, there may also be produced in this manner, soaps with an inferior lathering power. For a carefully produced quality-soap, the following method is advisable: A solid potash soap is produced separately with 70% coconut oil fatty acid and 30% stearine or stearic acid, and the corresponding quantity of 40% caustic potash solution. It must be seen to it that the saponification is complete and that neutralization is effected. If necessary an acid sulfonated oil may be used. The potash soap is framed, shredded after cooling, and dried, if desired. About 5-10 kilos thereof, mixed with 90 or 95 kilos of shredded soap base and milled, give a better lathering soap than a soda soap base alone. Even a greater proportion of potash soap could be used if the desired hardness of the entire soap will permit.

Inversely the lathering power of a potash soap can be improved in most cases by a slight addition of soda soap. This method is, of course, not suitable for liquid potash soaps which must have a crystal clear appearance, for even a very slight formation of soda soap,—whether the result of the direct addition of a soda soap, the simultaneous use of caustic soda solution, or due to the presence of any soda salts,—causes a clouding of the liquid soap. On the other hand, for creamy and solid potash soaps,—unless very stringent demands are made with regard to transparency,—a small soda soap content is of advantage. This fact, which has been learned from experience, is also taken into consideration in the production of shaving cream and shaving soaps in bars and in cakes by soap manufacturers.

Effects of Triethanolamine

THE influence of slight quantities of Triethanol soaps on the lathering power of soda soaps or potash soaps or their mixtures could not be foreseen, for although pure Triethanolamine soaps have a good cleaning action, they do not lather as heavily as one is accustomed to in the case of soda and potash soaps. Even the heaviest lathering triethanol soap obtained from triethanolamine and coconut oil fatty acid cannot compete even with the comparatively slight-lathering soda oleate soap. If triethanol soap is used in higher percentages in connection with the customary soaps, there is always noted a reduction of the lathering power. Only very slight additions of triethanol soap increase the lathering power of the complete soap, which is especially noticeable if the dirt to be removed contains fatty constituents.

The following method of saponification is the most efficacious: 5 kilos of coconut oil fatty acid are saponified in the hot with one kilo of triethanolamine which is diluted with one kilo of glycerin and two kilos of water. The remaining free coconut oil fatty acid is thereupon completely saponified with the required quantity of 50° Be. caustic potash solution. The subsequent treatment with lye is absolutely necessary for the reason that the glycerides which are present in all commercial fatty acids, can only be saponified by lye, and not by the triethanolamine which only reacts with fatty acids.

Without the subsequent treatment with lye, there would therefore remain fat residues which, in the most unfavorable cases, cause rancidity. It is true that the triethanolamine has a certain retarding action on the product becoming rancid, but it is preferable that one should avoid any cause for rancidity right from the start.

If one adds five kilos of the above soap to 100 kilos of soda soap chips, then, after working, a soap is produced which has a considerably higher lathering power than that of soda soap. In this connection there does not appear the peculiar odor inherent in pure or high percentage triethanolamine soaps, so that even the most delicate perfumes do not suffer therefrom.

The Addition of Fatty Acids

AFTER the fat charge, various added products are of the greatest importance in increasing the lathering power of soaps. Again and again, we note that only small quantities which at first sight might appear to be absolutely ineffective, in reality exercise the greatest influence on the lathering power. In this connection the principle applies:

Small quantities added seem to have an activat-

ing, supporting and improving action,—large quantities affect disadvantageously the properties of the soap and rather hinder the development of lathering power.

Even many decades ago, an excess of ricinoleic acid—(i.e., *not* soda or potash salt of the ricinoleic acid)—was praised as an addition for increasing the lathering power of the soap and has been used here and there. The best lathering power is obtained with 3% addition; with 5%, there can always be noted an increasing deterioration of this power. In favorable cases, no decomposition of the soap by the acid addition need be feared. As a matter of precaution, however, one should accompany the ricinoleic acid with a superfatting substance. Other fatty acids in excess are impossible, due to the great danger of decomposition and rancidity. Only stearic and similar high molecular saturated fatty acids can be used to the extent of about 1% to 3% for acidification, and in this way for increasing the lathering power, but then only by taking corresponding precautions. The stearic acid can be added to a solid soap either in the form of a concentrated stearate paste or in the form of fine stearic acid powder. In paste form, only a part of the acid is saponified, so that free stearic acid remains. In both cases, an addition of about 0.1% hexamethylenetetramine can be used in order to obtain a degree of preservation. Also 0.5% of sodium thiosulfate combined with 0.5% of benzoate of soda is theoretically suitable as a sufficient preserving agent. However, I have not sufficient experience (i.e., experience covering a sufficient length of time) with regard to the last mentioned combination. I have not great confidence in the stability and dependability of sodium thiosulfate (which by the way is not absolutely odorless) although in many articles, it is highly praised.

The lather of a soap with an excess of stearic acid becomes more creamy and heavier, on account of which, there is less objection to a greater coconut oil content in the fat charge. If added, however, to an extent of more than 3%, it checks too greatly the lather volume of toilet soaps. Shaving soaps and shaving creams can stand somewhat higher additions.

Effects of Sulfonated Products

ACID or neutral turkey red oils alone have a very inferior lathering power. About a half to two kilos per hundred kilos of 80% soap result in a stronger lather than the soap alone. A favorable factor in this connection is when a small part of *acid* turkey red oil remains in the soap without subsequent neutralizing. Not every turkey red oil is suitable for addition to soaps. Turkey red oil in connection with which, due to a hasty sulfonating, there has taken place on a large scale the formation of lactones and anhydrides, and where burning has occurred, will not only cause an inferior lathering, but also a dark color, disagreeable odor or other difficulties in connection with such soaps. In general there applies the rule: "The better sulfonated a turkey red oil is, the more resistant it is to the action of lime, acids and salts,—the greater lathering power will it impart to the soaps." Combinations of turkey red oil and other sulfonated preparations are available which are especially prepared for soap manufacture. Somewhat larger quantities of these can be incorporated than of ordinary turkey red oil.

Of interest in this connection are the sulfo preparations which are not directly derived from fatty acids. One of the simpler preparations is termed "betan" and is stated to be the sodium salt of the β-tetraline sulfo acids. The soda salt of the naphthalene sulfonic acid has probably the same simple but not very important effect. The sodium salts of alkylated naphthalene sulfonic acids are, however, much more resistant to acids, lime and salts. For instance, these are the products produced by the action of isopropyl, propyl or isobutyl alcohol or naphthalene sulfonic acids and their salts, for example sodium di-isopropyl naphthalene sulfonate. On a basis of these considerations, there were also evolved the most diversified wetting and emulsifying agents. Many of the last mentioned agents, unlike turkey red oils, have a good lathering power without soaps. In toilet soaps, sulfo preparations should, of course, not be used.

An increase of the lathering power of soaps can furthermore be obtained by slight additions of non-saponaceous emulsifiers, such as 1-3% additions of products as "tegin" or lanette wax. Greater additions influence the lather detrimentally in making it partly too heavy and partly not stable enough. "Curacit" sodium, i.e., the sodium salt of chonic acid (the principal agent of the emulsifying power of gall) acts well even in extremely small quantities. There is required about ½%. However, much larger quantities can be used.

Use of Casein

IT is well known that sodium caseinate makes the lather of soaps exceptionally creamy, heavy and stable. This fact has been made use of for some time in connection with toilet soaps. Although casein and its solutions are easily decomposed by micro-organisms, they are much more stable in soaps. A preserving agent, however, is

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A Review of the PATENTS FOR POLISHES —With Comments

By FOSTER D. SNELL

A REVIEW of the patent literature on polishes and allied substances by Dr. Snell, after years of experience in the field, carries an unquestioned badge of authority. He does not hide his frank opinion of most of the patents for polishing substances which have been issued in the United States. His "comments" present a most interesting sidelight of the patent survey.—The Editors.

THE polish industry may not exceed the steel industry in value of its product but it certainly does in the number of manufacturers. Many a "cellar" manufacturer has grown up to first floor space and then to factory size. By these so-called manufacturers, practically everything has been sold for polishing wood and lacquer. One inclined to dispute that broad statement should turn at once to the miscellaneous classification of this survey to be convinced.

No authoritative texts on the polish industry are to be found. In the course of years of work in that field, we have accumulated hundreds of patents representing probably as fair a cross section of the art as is in print. To avoid misunderstanding it should be added that the patents represent mainly disclosures which have not been litigated. For brevity, references to United States patents will give only the number of the patent. Few foreign patents will be referred to. They are equally numerous. For brevity, minor distinctions as to grades of mineral oil, denatured alcohol, etc., will be omitted.

The information herein is therefore that which has been specifically disclosed by the patentee in taking out a patent and is public property, subject to the life of the patent. The date of expiration of a patent can be determined by examination of the original. The caution should be added that the claims cited here are often the more specific ones and that general claims may be included in the original patent.

Clear Oil Polishes

ONE familiar with the field knows the typical clear oil polishes on the market, lemon-oil-free "lemon oil" from the petroleum industry and colored light lubricating oil. In every large city, at least one polish manufacturer is a retired piano polisher. His product is usually a clear oil, occasionally a two layer product, rarely an emulsion. The product sold is high in varnish and linseed oil, difficult to apply and rub up but of great efficiency when properly applied. A few examples follow.

Opinions might differ as to whether 11 per cent gum shellac, 63 per cent alcohol, 2½ per cent ether, 21 per cent raw linseed oil, 1¼ per cent fir balsam and 1¼ per cent Venice turpentine is a shellac varnish or a polish (983,783). Another pseudo-varnish is 6 per cent boiled linseed oil, 82 per cent commercial shellac solution, 6 per cent turpentine and 6 per cent denatured alcohol (1,401,907). It is really more of a filler than a polish and is so claimed.

Many products attempt to give a polish by, in effect, providing a new varnished surface of infinitesimal thickness. This purpose is defeated if any considerable amount of oil is also present because the oil serves as an additional plasticizing agent. Varnish has been specified as a polish in a mixture of 25 per cent benzine, 25 per cent paraffin oil, 37½ per cent turpentine and 12½ per cent varnish (1,397,102). A mixture of 20 per cent clear varnish, 20 per cent turpentine, 20 per cent raw linseed oil, 20 per cent kerosene and 20 per cent gasoline is another varnish type (1,411,193). One contains 66 per cent of gasoline, 25 per cent varnish, 3 per cent turpentine and 6 per cent castor oil (1,492,698), and another 4 per cent wax, 40 per cent kerosene, 20 per cent Japan drier, 4 per cent banana oil and 32 per cent varnish (1,495,613). In the last two, the additional plasticizer is not necessarily excessive.

Varnish may be taken seriously in 40 per cent spar varnish, 52 per cent turpentine, 7 per cent Japan drier, ¼ per cent black enamel and ¾ per cent ether (1,615,756), but in cylinder oil 4 ounces, varnish 2 drops, beeswax 2 drops, gasoline 10¾ ounces (1,639,316), the varnish amounts to only 0.05 per cent and can only be said to christen the product.

Another varnish is described as either a paint vehicle or a furniture polish. It contains 7 per cent raw linseed oil, 7 per cent brown japan, 3½ per cent beeswax, 0.0003 per cent ammonium chloride and the balance gasoline (1,017,323). As a pseudo-varnish 4 per cent of gum mastic, 3 per cent of lamp black, 89 per cent alcohol and 4 per cent naphthalene may be assumed to have polished automobiles at one time (1,376,228). A coating would be deposited by 19 per cent celluloid, 37 per cent amyl acetate, 37 per cent castor oil and 7 per cent spirit of camphor (British 330,801). A mixture of gum shellac, gum lac and gum sandarac in alcohol mixed with turpentine, linseed oil, paraffin and ammonia, with or without stains, has possibilities (British 1921).

A solution of 25 per cent chlorinated naphthalene and 15 per cent cresol-formaldehyde resin in 20 per cent of acetylene tetrachloride and 40 per cent of dichloroethylene, trichloroethylene or benzol is another product resembling a varnish (1,090,440). Fifteen per cent of chlorinated naphthalene in solution in a mineral oil heavier than kerosene and lighter than lubricating oil was originally covered by 12 claims (1,276,481) and later by 9 more (1,369,878).

The properties of varnish are approached closely by raw or boiled linseed oil in several, with or without drier. One of these contains 63 per cent boiled linseed oil, 26 per cent turpentine, 8 per cent beeswax and 3 per cent kerosene (1,730,654). Another contains 13 per cent linseed oil, 4 per cent olive oil, 4 per cent oil of rosemary, 17 per cent glycerine, 8 per cent oil of cedar, 4 per cent banana oil and 50 per cent turpentine (1,758,317). More complex but hardly more promising is 30 per cent lubricating oil, 10 per cent linseed oil, 15 per cent turpentine, 30 per cent kerosene, 5 per cent neatsfoot oil, 5 per cent glycerine and 5 per cent paint drier (1,208,545). With a little pigment, it would be a poor paint.

Another varnish-polish contains 67 per cent raw linseed oil, 17 per cent alcohol, 8 per cent turpentine, 8 per cent beeswax and a trace of ammonia (1,325,686). A weird mixture consists of 24 per cent linseed oil, 1½ per cent Japan drier, 5 per cent ether, 1½ per cent citronella, 20 per cent kerosene, a trace of coloring matter, 23 per cent lubricating oil and 24 per cent gasoline (1,528,991).

We may guess that a mixture of 72 per cent linseed oil, 24 per cent pine rosin, 3 per cent turpentine and 1 per cent beeswax (1,584,257) would be a liquid rather than a paste. Variety is introduced by 54 per cent boiled linseed oil, 38 per cent gasoline and 8 per cent *skunk* oil (1,566,576).

Many so-called lemon oils are on the market today. Here is one still valid: 50 per cent paraffin oil, 25 per cent raw linseed oil, 25 per cent lemon oil (1,267,236). Those marketed today are simpler. Most of them haven't even a bowing acquaintance with true lemon oil.

Various dilutions of lubricating oil are mentioned. A simple form is 33.3 per cent turpentine, 33.3 per cent alcohol and 33.3 per cent linseed oil (British 25,530). Another is 33 per cent refined crude oil to 67 per cent gasoline (1,362,260). The refined crude oil is defined as "collar fuel 14+" and the added gasoline is claimed to serve as a cleaner. Another is 86 per cent refined lubricating oil, 1 per cent varnish oak tan and 13 per cent gasoline (1,331,260).

Yet another is composed of 40 per cent light motor lubricant, 20 per cent kerosene, 20 per cent banana oil, 10 per cent wood alcohol and 10 per cent turpentine (1,402,058). Half its volume of gasoline may be added to the above. A more complicated one is 86 per cent paraffin oil, 6½ per cent turpentine, 1½ per cent yellow pine oil, 1½ per cent camphor oil, 1½ per cent cedarwood oil, 1½ per cent sassafras oil and 2 per cent beeswax (1,407,074).

One patentee does not trust the acid refining processes of the oil companies. He mixes two parts of mineral oil with one part of hydrochloric acid and lets the acid settle. He then mixes one part of this rerefined oil with 2 parts of commercial turpentine, adds 1 gallon of chloride of lime to each gallon and filters (1,121,590). A cleaner and polish for wood or almost anything else is composed of 65 per cent solution of the gum of the *chicken-grape vine*, 25 per cent neutral soap, 5 per cent salt and 5 per cent bicarbonate of soda (1,725,245).

To make one product take the place of two, a product is formulated of 80 per cent solvent naphtha and 20 per cent lubricating oil for both removing tar and polishing (1,356,869). Such a product is marketed as tar remover but is no longer claimed to be a polish.

Wax Finishes

MANY polishes contain varying amounts of wax. The hope is always entertained that a polish may contain sufficient wax to give a long lasting luster, but not enough to make it difficult to rub up.

An early wax finish was 5 drams of beeswax dissolved in 1 quart of gasoline, which amounts to a 1 per cent solution (1,146,173). Shortly thereafter, we find it amplified to 3 per cent bees-

wax, 11 per cent turpentine, a trace of oil of citronella and 86 per cent boiled linseed oil (1,182,516). One cannot imagine its use today, yet that patent will not expire until a year from next May.

Another clear wax preparation contains 10 per cent of white beeswax, 86½ per cent gasoline, 2 per cent wood alcohol and 1½ per cent nitrobenzene (1,239,416). A mild wax product contains 7.5 per cent rosin, 42.5 per cent boiled linseed oil, 5 per cent beeswax, 20 per cent alcohol, 20 per cent turpentine and 5 per cent terabine dryers (British 218,190). Another solution depositing a coating is 27 per cent beeswax, 9 per cent rosin, 9 per cent gum camphor, 46 per cent turpentine and 9 per cent gasoline (1,289,103).

The following wax is more complicated: 17 per cent wax of a kind not stated, 33 per cent turpentine, 33 per cent gasoline, 13 per cent banana oil, 2½ per cent nitrobenzine and 1½ per cent alcohol (1,383,427). One even more complicated is 5 per cent beeswax, 3 per cent natrolite, 24 per cent water, 20 per cent tetraline, 10 per cent benzine, 5 per cent carbon tetrachloride, 20 per cent linseed oil, 2 per cent oxalic acid, 1 per cent benzaldehyde and 10 per cent formaldehyde (255,101). This is truly an imposing list of ingredients.

Montan wax, refined by treatment with oxidizing agents other than nitric acid, such as chromic acid-acetic acid mixtures, may replace carnauba wax (French 644,149). The incorporation of cetyl alcohol, wool fat alcohols, mono or diglycerides of organic acids with acids such as stearic, palmitic or abietic and waxes such as spermacetti, montan, etc., gives suitable floor waxes (British 307,472). A novel form is 43 per cent beeswax, 32 per cent turpentine, 2 per cent paraffin oil, 20 per cent amyl alcohol and 3 per cent nitrocellulose (British 317,962).

Addition of 20 per cent of alpha chlornaphthalene to 80 per cent of polychlornaphthalene gives a soft crumbling solid which is used as a wood polish (British 392,058). The wax product may be colored with Prussian blue (British 330,014).

For the sake of brevity several pastes are summarized in Table I.

PASTE WAXES—TABLE I.

Patent Number	Paraffin	Carnauba	Bees-wax	Montan Wax	Ceresin	Turpentine	
847,226	3	..	..	..	..	..	12 petoleum oil 72 calcium carbonate 12 lard oil
910,569	22	..	11	..	..	..	67 corn meal
1,390,691	..	..	..	50	..	..	50 hydrogenated oil
1,392,477	..	..	16	..	..	..	18 soap 16 shellac 25 alcohol 25 sperm oil
1,535,952	..	8	..	3	16	66	3 coffee wax 4 dyes
1,595,690	..	5	..	7	16	66	4 dyes 1 coffee wax 1 rose wax
1,761,677	10	10	15	..	..	37	9 wood flour 12 pigment 5 sulfur 2 camphorlike material
1,733,389	25	..	..	..	..	..	25 kerosene 50 "Zeroline" cup grease
Swiss 130,701	18	5	..	..	13	64	
Brit. 309,853	..	..	24	..	..	..	18 petroleum oil 38 nitrobenzene 8 acetone, 12 collodion
Brit. 323,279	21	..	..	30	..	..	46 wax (Brit. 296,145) 0.3 nigrosine 0.7 stearic acid 2 ozokerite

Acid Polishes

IMPROVEMENT of wetting power by introduction of acids into polishes is old, very old. Every acid known has been used and most of them are recorded in the patent literature. The most common by far is acetic acid, usually in the form of vinegar. The acid polishes are so numerous that they have been briefly summarized in Table II. Vinegar has been entered as 4 per cent acetic acid, the government minimum requirement. Antimony chloride, often referred to as butter of antimony, in solution hydrolyzes to give basic antimony chloride and hydrochloric acid. Its use is therefore equivalent to addition of hydrochloric acid.

ACID POLISHES—TABLE II.

Patent Number	Strengtth of Acetic Acid %	Percentage of Acetic Acid	Percentage of Hydrochloric Acid	Gasoline	Kerosene	Lubricating Oil	Raw Linseed Oil	Boiled Linseed Oil	Turpentine	Varnish	Dryer	Alcohol	Antimony Trichloride	Water	Nitrobenzene	
854,488	4	33	..	..	33	..	..	33	..	..	..	..	..	..	..	
916,294	4	40	..	..	..	20	..	..	20	..	..	..	..	..	..	
961,903	4	14	..	25	..	55	..	..	6	..	..	..	..	..	..	20 fresh eggs
1,015,688	4	5	..	5	..	..	10	..	..	20	15	..	..	..	..	35 crude oil 10 castor oil
1,088,998	4	25	..	..	..	..	50	..	..	..	..	..	..	..	..	12 high wines 7 eggs, 6 sugar
1,166,494	4	37	..	..	19	19	..	..	..	..	..	19	2	..	2	2 glycerine
1,218,163	4	43	2	..	32	..	..	..	10	..	..	..	..	..	..	3 sulfuric acid many others
1,222,441	4	70	..	..	..	..	25	..	..	..	..	..	..	..	..	2 citronella
	100	3	..	..	..	..	..	..	..	..	..	..	..	..	..	
1,295,584	4	45	..	..	..	..	45	..	2	..	..	5	..	..	..	3 black antimony
1,314,482	36	2	..	..	..	16	..	..	..	..	..	20	0.5	59	2	
1,356,075	4	62	1.5	..	..	..	23	..	..	..	..	5	4.5	..	3.5	0.8 red dye
1,359,536	4	18	..	..	..	..	73	..	9	..	..	..	..	..	..	
1,382,127	4	25	..	..	..	..	25	..	25	..	..	25	..	..	..	
1,396,346	4	47	..	..	..	47	..	..	..	..	..	..	2	..	..	2 carbon tetrachloride 2 oil of lemon grass
1,400,826	100	1	..	..	..	45	..	..	..	..	..	21	1	21	..	11 oil of cajeput
1,410,471	4	29	..	..	..	26	26	..	..	12	3	..	..	..	..	4 paraffin
1,411,550	..	..	..	..	..	..	..	50	25	3.5	..	18	2.5	..	..	1 Fullers earth
1,415,570	5.5	66	..	..	..	..	..	21	12	..	..	..	..	..	..	1 benzyl ester
1,438,118	4	3	..	..	..	..	50	..	3	..	..	28	2	11	..	2 citronella
1,453,000	4	50	..	..	..	..	..	..	..	..	..	..	..	..	..	1 gum mastic 25 olive 25 corn
1,457,080	4	25	..	..	..	45	..	17	5	..	..	..	..	..	..	8-10% ammonia
1,474,133	..	..	..	..	..	20	..	..	..	..	..	..	..	52	..	10-50% phosphoric acid many others
1,496,735	4	25	..	..	..	..	44	..	25	..	..	..	..	..	..	6 Listerine
1,545,272	..	..	5	..	..	..	23	..	12	..	..	23	3	..	..	23 Chinawood oil 5 oxalic acid 3 citronella 3 cedar
1,555,149	4	24	..	10	..	..	..	..	..	..	..	..	34	..	..	12 furfural 18 soap
1,572,021	4	24	..	..	24	..	38	..	12	..	..	..	..	..	..	2 spirits of camphor
1,709,819	..	..	1.5	..	..	..	..	..	..	..	..	..	..	..	..	mainly juice of decayed fruit
1,733,299	30	12	..	..	..	19	..	..	..	..	..	..	..	..	..	many others
1,774,221	4	2	..	..	..	..	80	..	..	10	..	..	..	..	..	8 four different acids
Canadian 281,883	4	14	..	..	..	14	..	..	14	..	..	..	3	47	..	6 beef gall 2 copper solution
Brit. 3,834	4	20	..	..	..	..	39.6	..	20	..	..	20	0.3	..	..	0.1 jewelers rouge
Brit. 328,920	4	10	..	..	..	..	35	..	..	..	..	45	5	..	..	5 Bismark brown
Brit. 367,392	4	30	..	..	..	..	30	..	..	..	..	30	8	..	..	2 citronella

(*To be continued*)

An easy polishing wax has been developed by E. I. du Pont de Nemours & Co., the new product being described as a wax emulsion rather than a mixture of wax with a volatile vehicle. It is said that it does not settle as do some liquid waxes. Other advantages are the absence of "drag" and the short time necessary for drying before polishing.

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The rate of duty on imports of yellow, brown, blue-mottled and similar soaps into Trinidad has been increased from 4 s. per 100 pounds to 10 s. per case of 50 pounds by the Trinidad Legislative Council. The rate under the British preferential tariff has been increased from 2 s. per 100 pounds to 5 s. per case of 50 pounds. The class of soaps affected by the new rates does not include polishing or soft soaps.

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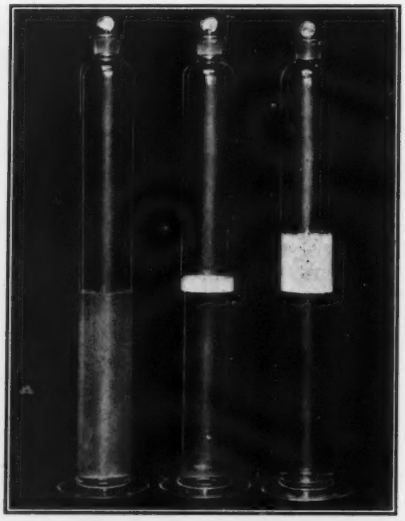
Advertising of the shampoos made by Petropalm Corp., New York, has been turned over to Winthrop & Co., New York agents.

The Closure Sells New Uses

THE primary purpose of any closure, of course, is to seal the container and to keep it sealed from plant to consumer and between the times of use. It is apparent that no product can be removed from its container to be used without first removing the closure. This naturally means that the cap is certain to come under the inspection of the user. He may not notice the beauty of the bottle or can, he may not study the label or read the directions, but he *cannot avoid* looking at the closure as he opens the container or reseals it after use. It is one part of the container which is linked closest by circumstances with actual use.

The new caps on the well-known Johnson's Wax bottles and cans take full advantage of their position by acting as miniature billboards for the various uses of the wax. The different "messages" are placed on an equal number of caps indiscriminately in the packaging operation. Each suggests a definite and specific use. The present series of "messages" consists of five as shown and is used throughout the entire line. The new Johnson Wax container line, incidentally, shows a complete duplication in glass and tin all the way from the half-pint sizes right through to the gallon sizes. The cans are supplied by Continental Can Co. and the bottles by the Owens-Illinois Glass. Co. The closures being used are Kork-N-Seal by the Williams Sealing Corp. And the wax, in case you do not know, is manufactured by S. C. Johnson & Son of Racine, Wis. The caps are brilliant red in color and printed in black.

SILICATES OF SODA IN SOAPS



A FAR CRY from the washing needs of the Valley of the Nile to our complex cleaning problems of today! But soap is still bought first of all for its ability to remove dirt. Every soap manufacturer strives to put into his brand better washing properties, and so the phenomenon of cleansing continues to be a deep study.

Through the years—now more than a hundred—soluble silicates have earned a useful place in soap making. Silicate of soda and soap do a better cleaning job than pure soap and measurements have been made of this fact. In this series of advertisements, we shall consider the elements of the washing process, and how mixtures of soap and silicate of soda perform in each.

Take the case of suds. The lathering power of soaps is greatly increased by the use of silicate of soda. Our illustration contrasts the suds produced by pure soap, soap and soda ash, and soap and silicate of soda. On shaking all the tubes in exactly the same manner, we observe that after a short time there are no suds on the soap solution in the left hand tube, suds on the soda ash solution are small, and falling rapidly, while the suds on the right hand tube containing silicate are abundant with no tendency to fall.

NEXT MONTH
a discussion of
"Wetting Properties of Silicate"

PHILADELPHIA QUARTZ CO.

Makers of "N" Brand Silicate of Soda

General Offices and Laboratory:
121 S. THIRD STREET, PHILADELPHIA

Field Sales Office:
205 W. WACKER DRIVE, CHICAGO

WORKS:
ANDERSON, IND. BALTIMORE, MD. CHESTER, PA. GARDENVILLE, N. Y. KANSAS CITY, KANS. RAHWAY, N. J. ST. LOUIS, MO. UTICA, ILL.

NEW PRODUCTS

THE march of new products to market goes on without interruption. When we look back to the years 1931 and 1932 a short time hence after business has resumed something akin to a normal pace, there will undoubtedly be apparent certain "blessings of the depression." Certain new products which have been developed under the necessity of meeting keener competition, and because a lull in business has given the time and opportunity for the development work, will be listed among the "blessings." Another thing on the list will be package changes and improvements for old products. Few are the houses which today are not pushing additions to their line to take up the slack of lessened business, or who have not turned to package design revision as a means of stimulating sales.

Three attractive packages for three entirely different type products which were designed by Anchor Cap and Closure Corp. are the Griffin linen shoe cleaning fluid, the Eagle shoe cream, and the Johnson silver polish. The new feature of the shoe cream container is rather unusual. Inside of the regular Amerseal cap which forms the main closure, is a thin metal seal which fits tightly over the jar and prevents evaporation and hardening of the polish before it gets to the consumer. The Johnson jar carries a metal cap and the Griffin bottle a moulded closure. Two new shampoo products in the ten cent size are also shown. These carry out the "companion package" idea. They are products of John Woodbury which is owned by Jurgens of Cincinnati. Live and attractive packages—these bottles and closures were designed and manufactured by the same company.

Then we have a new group of products put out by an old and well-known house which won its fame originally as a manufacturer and merchandiser of soaps. The new line of the Larkin Company consists of six items—a companion line put out in the same size and style of bottle with a

uniform closure for all. The general design of the labels is also uniform throughout, varying in color combinations according to the individual products. Included are a liquid wax, white and orange shellac, renovating varnish, turpentine and linseed oil—a general household group.

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American Dental Association has placed its seal of endorsement on "Plough's" tooth paste, manufactured by Plough, Inc., Memphis. The

application of Calsodent Co., New York, for endorsement of "Calsodent" tooth paste has been refused "because it is an unessential modification of salt; it is marketed with unwarranted therapeutic claims, and the name does not inform the user that salt is the main ingredient. The claims made by Calsodent go beyond those permitted by the Council for its consideration as a dentifrice, as decided therapeutic claims are made in its promotion.

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A. D. M. A. Meets April 17th

The twenty-first annual meeting of the American Drug Manufacturers Association will be held at Greenbrier, White Sulphur Springs, West Virginia, April 17 to 21. Meetings of the scientific, biological, pharmaceutical and crude drug sections will be held April 18 and 19, the first general session opening on April 20. One of the features of the entertainment program will be the annual banquet held on the evening of April 20. As usual an extensive program of entertainment for the attending ladies has been arranged. The usual golf tournament will be held on the afternoon of April 20. A. D. Armstrong, Fritzsche Bros., New York, heads the entertainment committee, and will be assisted by A. A. Wasserscheid, Mallinckrodt Chemical Works. Other members of the committee are: Albert A. Teeter, Charles Pfizer & Co.; S. Barksdale Penick, Jr., S. B. Penick & Company; Victor Williams, Monsanto Chemical Works; Harold W. Simpkins, Mallinckrodt Chemical Works; Melville Eaton, Norwich Pharmacal Company; George Simon, Heyden Chemical Corporation; James T. Pardee, Dow Chemical Company; Percy Magnus, Magnus, Mabee & Reynard; John P. Remensnyder, Heyden Chemical Corporation; James J. Kerrigan, Merck & Co.; Frank McDonough, New York Quinine & Chemical Works.

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The manufacture of soap from sulphite waste liquor has been started recently in Sweden and Finland. This process promises to find further application. It is estimated that approximately 66 pounds of the basic oil can be reclaimed from each ton of pulp, and estimating the annual output of sulphate pulp in Sweden at 600,000 tons, no less than 18,000 tons of oil can be reclaimed. Both Sweden and Finland are exporting this oil to Germany at the present time. In Sweden it is known as "tallol"; in Germany as "liquid rosin."

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Sherka Chemical Company successor to the Schering Corporation as American sales agents for industrial and pharmaceutical chemicals, have moved to 75 West Street, New York, N. Y. The new telephone number is Bowling Green 9-7482.

SECURITY PRICES

PRICES of stocks of soap, chemical, insecticide, and allied companies as quoted on the New York Stock Exchange, Curb Exchange, other exchanges and over-the-counter are given in the following table. This table of prices is compiled monthly for *Soap* by a representative of one of the oldest and best-known brokerage houses in New York.

	High 1932	Low 1932	March 1 1932	April 1 1932
Allied Chem.	87½	62¼	77	73
Am. Agric. of Del.	7½	5¼	5¾	5½
Amer. Cyan. "B".	5⅜	2⅞	3⅞	3½
Armour of Ill. "A"	2	1	1⅜	1¼
Bon Ami "A"....	51¼	48	49	48
Brillo	6⅝	6⅝	6⅝	6⅝
Colgate, P. P....	31½	24¾	29⅛	26
Conso'dated Oil Co	7⅛	4¼	6⅛	6
Corn Prod.	47⅜	37	44⅜	40⅞
Coty	4¾	2⅝	3¾	3
Dow Chem.	36	29⅛	34½	30
Drug, Inc.	57	45¼	52	45⅜
Du Pont	59¾	44	54½	44⅛
Glidden	7	4¾	5¼	5⅛
Gold Dust	19⅝	16	17⅜	16¼
Gulf Oil	35⅞	25⅜	29¾	31⅞
Heyden	8½	6½	8¼	7⅛
Int. Agric.	1½	½	1	½
Lehn & Fink	24¼	18⅛	21	18⅛
Mathieson	20⅞	13¼	15¾	14¼
McKess. & Rob...	5½	3	4	3¼
Monsanto	30¾	20¾	24	23
Newport "A"....	No Sales			
Proc. & Gamb...	42¾	29⅝	40	30⅞
Shell Union	4⅛	2¾	3⅝	3⅛
Sher. Will	35	26½	32½	28½
S. O. of Cal.....	27¼	22½	24⅝	24
S. O. of Ind.....	17¼	14	15¾	15
S. O. of N. J.....	31½	25⅜	28¼	27⅞
S. O. of Ohio.....	28½	23¾	25½	25
Swift & Co.....	18⅞	16⅞	18⅝	17
Union Carb.	36⅜	27¼	32⅞	27⅜
Westvaco	12⅝	9	11¾	10½
Wilson & Co.....	1¾	¾	1	1¼

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Exports of toilet or fancy soap from United States during January, 1932, totaled 319,235 lbs., worth $46,611, as against 358,567 lbs., priced at $73,901 during January, 1931.

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Exports of laundry soap from United States during January, 1932, totaled 1,552,244 lbs., worth $84,055, as against 2,331,879 lbs., valued at $142,411, during the same month of last year.

P. & G. Tonnage Slightly Reduced

In a recent report to stockholders of Procter & Gamble Co., Col. William Cooper Procter, stated that tonnage sales for the nine months ended March 31 were approximately five per cent under those for the same period of the previous year. March, 1932, was a good month, sales in this period totaling higher than those reported for the same month of 1931. Production schedules are being maintained without any undue expansion of inventory and stocks of raw materials and finished goods are expected to be about normal by June 30. In his statement to the stockholders Col. Procter indicated that on April 12th the directors would declare the regular 60c. dividend, payable May 16th.

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For the year ended December 31, 1931, McKesson & Robbins, Inc., reported a net profit of $2,583,651.56, after expenses and depreciation. This compared with $3,469,715.91 in 1930. Combined profit before all dividends, was $1,845,739.39, as compared with $2,629,196.46 in the previous year. This was equal to 23 cents per common share, as against 96 cents per common share in 1930. Net sales for the year amounted to $119,967,384.71, which compared with $134,865,440.02 in the preceding year.

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John F. Queeny, chairman of the board of Monsanto Chemical Works, was honor guest at a special dinner given for him at The Racquet Club in St. Louis, March 21, as a tribute to his sixtieth anniversary of continuous activity in the chemical industry.

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Dr. H. R. Carveth, president of Roessler & Hasslacher Chemical Co., has resigned this position as well as his membership on the boards of directors of Roessler & Hasslacher Chemical Co., and E. I. du Pont de Nemours & Co. Charles K. Davis, president of Du Pont Viscoloid Co., another du Pont subsidiary, succeeds Mr. Carveth as head of Roessler & Hasslacher.

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Foster D. Snell addressed the class in Industrial Administration at the College of the city of New York on March 15th. His subject was "The Relation of the Consulting Chemist to Business."

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J. E. Lockwood, for the past 12 years connected with Hercules Powder Company's naval stores activities, has announced his resignation, and will open his own office in Savannah. He will specialize on naval stores problems. Hercules Powder Company has retained Mr. Lockwood as a consultant on naval stores matters.

C-P-P Inaugurates Sampling Campaign

Colgate-Palmolive-Peet Co. is at present working on a sampling campaign which is expected to reach 27,000,000 consumers throughout the United States. Samples of "Colgate's Ribbon Dental Cream," "Colgate's Rapid Shave Cream," "Palmolive Shaving Cream," and "Palmolive Soap" will be distributed, and tokens and coupons having an aggregate redemption value of $8,100,000 will be issued. Each of the latter will have a value of ten cents toward the purchase price of any of the four products mentioned. The campaign will cover every city and town in the United States and personal door-to-door calls will be made at the homes of 75% of the inhabitants.

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Tariff Board Reports on Oil Imports

Costs of production of foreign vegetable oils and the effect of imports of these oils on domestic producers are considered in a report to the Senate made March 25 by the United States Tariff Commission. The report covers copra, coconut oil, palm, palm kernel, rapeseed, perilla, sesame and other imported vegetable oils, analyzing the technical and economic factors which determine the use of foreign or domestic products. The report states that imported oils supplement, rather than displace, domestic oils. Both consumption of domestic oils and imports of foreign oils are shown to be increasing.

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With 25 factories of their own turning out soaps of various kinds, valued at close to $10,000,000, South Africans still show a great liking for imported shaving creams, sticks and powders as well as fine toilet soaps, importing over half a million dollars worth. American soap exports to this market were $93,000 in 1930, toilet soaps making up $39,000 and shaving creams $14,000 of this total. Major imports come from Great Britain, but the American share is growing.

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Anchor Cap & Closure Corp., L. I. City, has issued a folder, entitled "The Down View," emphasizing the importance of the attractive appearance of a container when viewed from above. It is stated that nine times out of ten purchase of an article results from a "down view" analysis of it.

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Felton Chemical Co., Brooklyn, has issued a revised catalog and price list. Included in the list are quotations on three new sets of naphthalene perfumes and colors.

Protests on Soap Duties

Yardley & Co., New York, in a protest to the U. S. Court of Customs Appeals, was successful in having the duty on a stearin chip soap reduced from 30% to 15%. In another protest Owl Drug Co., New York, had the duty on certain soap reduced from 30% to 15%. The same company in another case had the duty on an imported castile soap reduced from 30% to 15%. J. W. Levy Corp., New York, was successful in having the duty on a fancy soap reduced from 60% to 30%. A recent decision of the Commissioner of Customs classifies wax covered soap dogs and cats as toilet soap, duty to be assessed under paragraph 80 of the 1930 Tariff Act at 30%.

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R. R. Deupree Writes on Salesmanship

The republication by Doubleday Doran of "An Outline of Careers" will direct additional attention to one chapter of the book dealing with an estimate of salesmanship as a career, by R. R. Deupree, president of Procter & Gamble Co. Concerning salesmanship Mr. Deupree says in part: "There are many intangible advantages in a selling career. There is no phase of business life more interesting. The average man selling goods will, of course, travel, and travel is the peer of all experiences in broadening a man. He must take care of himself under almost any kind of condition imaginable. He must meet all kinds of people and must be able to get along with them. He is constantly training himself to control the circumstances in which he finds himself and this gives him a broad, fine understanding of life and develops his ability to meet life's problems with poise and judgment based upon this experience. No good salesman can feel harnessed to his job, for the man who can sell one thing has a right to feel that he can sell another."

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The team representing Colgate-Palmolive-Peet Co. in the New York Wholesale Drug Trade Bowling Association was in first place on April 8th, with a record of 25 games won and 11 lost. The leaders won three games April 4th, defeating the teams representing American Cyanamid Co., Mallinckrodt Chemical Co. and Carbide & Carbon Chemical Co.

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Imports of castile soap into United States during January, 1932, amounted to 211,099 lbs., worth $18,651, as against 263,281 lbs., valued at $27,522, during the same month of last year. Imports of toilet soaps in January, 1932, totaled 38,466 lbs., worth $11,459, as against 67,922 lbs., valued at $18,591, during January, 1931.

CHICAGO TRADE NOTES

CHICAGO PERFUMERY, SOAP AND EXtract Association held its Annual Spring Frolic on Thursday, April 14th, at the College Inn, in the Sherman Hotel. Dance music was provided by the famous Coon-Sanders Orchestra, and there were five acts of entertainment. Arrangements were under the charge of W. Kedzie Teller. He replaced Russell G. Brown, who was forced, in the press of other duties, to ask for a substitute in managing the spring party. Assisting Mr. Teller on the committee were D. A. Day, of Heine & Co.; Walter H. Jelly, of Walter H. Jelly & Co.; and Roy F. Downs, of Owens-Illinois Glass Co.

The Association held its second meeting under the new monthly schedule in the form of a luncheon at the Hamilton Club on Wednesday, April 6th. The members were addressed by Matthew D. Hartigan, Democratic candidate for State's Attorney at the coming election. Secretary William H. Schutte has announced that the new arrangement has won widespread approval. The new directory of memberships for 1932 was recently distributed and showed an active membership list of seventy-six firms, with an average representation of three persons to each membership.

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Chicago Drug and Chemical Association held its Annual Spring Dance Party on Thursday evening, March 24th, in the Ballroom of the Stevens Hotel. About two-thirds of the membership were represented and entertainment, music, dancing, souvenirs and other accessories that have made these parties famous, were provided to the eminent satisfaction of everyone. At the Annual Election of Officers, held on Thursday, March 31, at a luncheon at the Hamilton Club, the following new officers, as presented by the nominating committee, were elected: President, William O'Neill, of Emerson Drug Co.; Vice-President, E. L. Drach, of Abbott Laboratories; Treasurer, M. B. Zimmer, of Fritzsche Brothers, Inc.; Secretary, J. W. Brooks, of Bristol-Myers Co.; the new directors elected were as follows: W. A. Kocks, of Victor Chemical Works; F. L. McCartney, of Norwich Pharmacal Co.; C. H. Spaulding, of Parke, Davis & Co.; and William H. Muttera, of Armstrong Cork Company.

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Mr. and Mrs. Llewellyn S. Helfrich received a great many congratulations from members of the cosmetic and allied trades upon the celebration of their 60th wedding anniversary, which took place at their California home on March 3d. Llewellyn S. Helfrich is the father of J. H. Helfrich who organized in 1922, and has since successfully carried on, Helfrich Laboratories, of Chicago. Mr. Helfrich, Sr., has long been known in the trade, having been associated, successively, with the French Cave Co., of Philadelphia, James S. Kirk & Co., of Chicago, and The Baldwin Perfumery Co., also of Chicago.

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L. A. Jerome Laboratories were recently incorporated as a general cosmetic business at 605 N. Michigan Avenue, Chicago. The principals represented are, Lauretta Larson, Ralph J. Gutgesell and Earl W. Bradley.

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The occasion of the Ninth Annual Midwest Beauty Industry Show, held at the Hotel Sherman on Monday, Tuesday and Wednesday, March 28th, 29th and 30th, was an extremely busy one. Thousands of cosmeticians from all parts of the country flocked to the exposition and the original allowance for space for exhibits had to be considerably extended at the last minute. The show was staged under the auspices of the Chicago and Illinois Hairdressers Association, of which Max Hoefer is President.

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Shaving soaps increasing in favor in Japan, are gradually displacing the use of ordinary soap for this purpose. Displays in the local shops in the Kobe-Osaka market indicate that the United States is far ahead of all other foreign countries in this line. Little shaving soap is manufactured locally.

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Opportunities for Export

The following opportunities for export of American soaps and allied products have come to the Bureau of Foreign and Domestic Commerce, Washington, D. C. American manufacturers can secure the full details of the inquiries by communicating with the Bureau, care of the Department of Commerce. Be sure to mention the number of Foreign Trade Opportunity in writing.

56,610	Polishes	Czecho-slovakia	Agency or Purchase
56,615	Toilet preparations	Japan	Purchase
56,671	Toilet soaps and shaving creams	Norway	Agency
56,833	Toilet soaps	Portugal	Purchase
56,902	Toilet soaps and powders	Trinidad	Sole Agency
56,903	Soap	Netherlands	Agency
56,958	Laundry soaps	Porto Rico	Agency
56,978	Liquid toilet soaps and disinfectants	Canada	Purchase
56,979	Disinfectants and insecticides	Germany	Agency
56,983	Toilet soaps	Mexico	Agency
57,151	Toilet soaps	Italy	Agency

A. M. T. A. Meet at Ambassador, April 26-28

The annual convention of the American Manufacturers of Toilet Articles will once more be held at the Ambassador Hotel, New York, this year, April 26, 27 and 28. After considerable discussion the Executive Board reached this decision and also agreed to have the general plan of the convention follow the procedure of previous years. Frank J. Lynch, chairman of the entertainment committee, has arranged for the usual theatre party and supper dance on first evening of the convention, the show selected being "Hot-Cha", a new Ziegfeld production. The evening of the 27th has been left as an open night, and on the 28th the annual banquet will take place. Luncheons are scheduled for each day of the meeting. At the business sessions the committee has scheduled prominent speakers on advertising, merchandising and packaging topics.

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Testimony indicating that laundry supply houses have refused to sell certain laundries was introduced in the inquiry into charges of monopoly in the laundry industry being conducted by Referee Nathan Friedman in New York. A salesman for a metropolitan soap company denied that his company had told him to stop selling soap to the West End Laundry, Brooklyn, but admitted that at gatherings of salesmen he had learned that telegrams had been sent to other salesmen by supply houses telling them to stop selling this laundry and certain others, even though payment was made upon delivery.

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The Association of American Soap and Glycerine Producers has been named by the American Trade Association Executives as one of the organizations whose accomplishments over the past year have been of most value to the public, to its own industry and to industry at large. The American Paint and Varnish Manufacturers' Association was selected as recipient of the 1931 A. T. A. E. award, with the American Soap and Glycerine Producers Association as one of four others accorded honorable mention.

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Benjamin Levitt, chief chemist for Chas. W. Young & Co., Philadelphia, delivered a lecture on the manufacture of soap, disinfectants and related products, before the chemistry students of Temple University, Philadelphia, April 7.

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Industrial Chemical Sales Co., New York, has issued a booklet describing the use of activated carbon in removing unpleasant tastes and odors from water for drinking purposes.

P. & G. Loses Whale Oil Duty Suit

Whale oil made at sea is still dutiable for entry into United States when made on a ship of foreign registry, according to a decision by the U. S. Court of Customs and Patent Appeals in the action brought by Procter & Gamble Co. to avoid payment of the six cent a gallon duty on 12,000 tons of whale oil manufactured on board the Norwegian whaler, C. A. Larsen. The contention of the soap manufacturer was that the oil, being produced on the high seas, could not be construed as coming from a foreign country, and so was exempt from the duty. The Court, avoiding the question of whether a ship of foreign registry represents foreign territory, based its decision on the probable intent of Congress in framing the tariff legislation. The Court agreed that Congress intended to make dutiable all whale oil not the product of American fisheries.

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Opportunities for Export

The following opportunities for export of American soaps and allied products have come to the Bureau of Foreign and Domestic Commerce, Washington, D. C. American manufacturers can secure the full details of the inquiries by communicating with the Bureau, care of the Department of Commerce. Be sure to mention the number of Foreign Trade Opportunity in writing.

55,900	Shoe polish	Spain	Agency
55,910	Tooth paste	Norway	Agency or Purchase
55,960	Insecticides	Denmark	Agency or Purchase
56,022	Dentifrices	Czechoslovakia	Agency
56,029	Agricultural insecticides	China	Purchase
56,033	Kitchen soap	Egypt	Agency or Purchase
56,095	Toilet and laundry soaps, low priced	Porto Rico	Agency
56,147	Soap making chemicals	Guatemala	Agency
56,166	Toilet soaps	Yugoslavia	Agency
56,167	Toilet soaps	Porto Rico	Agency

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Shampoos for use exclusively on the hair and scalp have been held dutiable by the United States Court of Customs and Patent Appeals as preparations for the hair under paragraph 62 of the 1922 Tariff Act, rather than as toilet soap under paragraph 82.

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Exports of dental creams from United States during January, 1932, were 117,517 lbs., worth $90,888, as against 182,323 lbs., worth $166,999 during January, 1931.

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For the second successive year the Delawanna, N. J., factory of Givaudan-Delawanna, Inc., has been awarded a perfect safety record by the New Jersey State Department of Labor.

PERSONAL AND IMPERSONAL

The entire appropriation for advertising "Pebeco" tooth paste and "Hinds' Honey and Almond Cream," products of Lehn & Fink, Inc., is being spent on radio this year. The company continues to use magazine space in advertising "Lysol."

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Roscoe C. Edlund, director of Cleanliness Institute, in a talk before the annual convention of the American Brush Manufacturers Association at Atlantic City, N. J., March 17, urged greater cooperation among the cleanliness industries in financing educational programs to promote cleanliness. He described such a program as not only good business, but sound public service.

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One of the products of the newly formed M. A. V. Cosmetics Manufacturing Co., Los Angeles, is a liquid shampoo.

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Parfums Francais, Inc., New York, are introducing to the American market highly perfumed soaps manufactured by Lemoine, French soap maker. The soap, marketed under the name, "Sari," retails at the price of six cakes for fifty cents.

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R. P. Shea, sales and advertising manager for the Mobo department of John T. Stanley Co., New York, died recently. Death, which occurred suddenly, was caused by acute appendicitis complicated by a stomach disorder. Mr. Shea had been connected with the Stanley company for ten years.

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Cremoline Co., manufacturers of liquid soap, 2 S. Commercial street, St. Louis, have removed to 5286 Waterman Ave.

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The package in which "Linit," a bath preparation, is marketed was judged the best package of the year at the second annual Packaging Conference held in Chicago last month. The "Linit" package was favored because of the visibility of the name, the freshness of the package design and the appropriate color.

A fire in the plant of Brooks Oil Co., Cleveland, soaps and oils, March 30, caused damage estimated at $25,000.

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Ferd. Muelhens, manufacturer of "4711" Eau de Cologne, has established a factory in England at Slough, Buckinghamshire, where the entire "4711" line of toilet preparations will be manufactured. This move was made as the result of the recent imposition of a 50% duty on imports of perfumes and toilet preparations into England.

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B. T. Babbitt, Inc., New York, is reported to have made arrangements for the manufacture in Toronto of cleansing compounds for sale to the Canadian and British Empire markets.

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The bowling team representing the factory of Givaudan-Delawanna, Inc., in the Passaic, N. J., Y. M. C. A. Industrial Bowling League won the League championship, March 17, by defeating the U. S. Rubber Co., team in two matches.

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Among the products of the newly established Harrah Laboratories at Charleston, W. Va., is a shampoo.

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Roessler & Hasslacher Chemical Co., Niagara Falls, has issued a folder describing the use of sodium perborate in soaps, antiseptics, dental creams and cosmetics.

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Dr. A. T. Frascati, head of the perfume laboratory of Ungerer & Co., New York, has returned from a six weeks' trip through the Middle West and South. He reports an almost universally optimistic outlook for the future in that district.

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A catalog of modern machinery and equipment for the manufacture of soaps and cosmetics has been issued by A. Savy, Jeanjean & Cie., Courbevoie, near Paris, France.

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Empire Chemical Co. has been organized in Green Bay, Wis., to manufacture soaps and washing powder.

American Soap Corp., formerly located at 106 Broadway, Jersey City, N. J., has occupied new quarters at 68 Ramapo Avenue, Paterson, N. J.

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Colgate-Palmolive-Peet Co. is reported to have purchased a substantial interest in Binder & Ketels, German soap manufacturers. The name of the concern will be changed to Palmolive, Binder & Ketels, but for the present there will be no change in officers or personnel. It is expected that under the new arrangement economies will be effected in the distribution of the products of Colgate-Palmolive-Peet Co. in Germany.

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Wilson & Bennett Mfg. Co. announce the purchase of the New Orleans plant of National Steel Barrel Co. Production and sales from this division will not be interrupted by the change of ownership. Roy E. Hurd, previously in charge of barrel sales for his office, has been retained as Southern District Manager.

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According to cables from U. S. Commercial Attache Brookhart at Bangkok, duties on toilet soap and shaving soap imported into Siam have been increased from 30 per cent ad valorem to 33 1/3 per cent ad valorem. Ten days were allowed for the clearing at old duty rates of goods landed before February 22 and not in bond.

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Truempy, Faesy & Besthoff, Inc., importers of caustic potash have recently moved their New York offices from 75 West street to 22 East 40th street.

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Executives and department heads of Givaudan-Delawanna, Inc., New York, participated in a farewell dinner given to Jacques Riedweg, representing L. Givaudan & Cie., prior to his sailing for France on the *Bremen* early last month. Mr. Riedweg had been in United States since last fall, introducing new products of the laboratories of L. Givaudan & Cie. for the soapmaker and perfumer.

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Colgate-Palmolive-Peet Co. has opened a branch accounting office in Atlanta at 56 Marietta Street. H. G. Gardner, formerly district manager with headquarters in Chicago, will have charge of the new office which will employ forty persons.

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Fuld Brothers, Baltimore, Md., manufacturers of sanitary products for the jobbing trade, have moved their plant to 2310 Frederick Avenue.

Over 700 members and guests of the Drug and Chemical Section of the New York Board of Trade attended the seventh annual dinner of the Board held at the Hotel Commodore, New York, March 15, the largest gathering of its kind ever held by the chemical, drug, and allied industries. Percy C. Magnus, president of Magnus, Mabee & Reynard, Inc., and chairman of the Section, headed the committee and presided at the dinner. R. D. Keim, general sales manager of E. R. Squibb & Sons, was toastmaster. Representative groups from practically every national drug, chemical, insecticide, soap, and allied trade organization in the country attended.

ON PRODUCTS AND PROCESSES

Sodium thiosulfate is claimed to prevent rancidity and spotting in milled toilet soap. Rancidity and brown spot formation was induced purposely in slabs of soap. These slabs were worked up into finished bars. Some slabs received 0.2% sodium thiosulfate during milling, both with and without perfume. All were compared side by side with other various treated cakes for a period of two years. The thiosulfate prevented spotting and rancidity in all cases, as these conditions were stated to be due to oxidation of different ingredients of the soap.—*Seif. Zeitg.*, 58,711, 1931.

—o—

A stabilizer for soaps and oils is stated to be a phenolate made by the reaction phenylphenol with a base which is itself a stabilizer, such as diphenylguanidine, triethanolamine, or an alkylene diaryldiamine.—Canadian Patent No. 315,980.

—o—

Saponification savings are reported by saponifying first in the hot with milk of lime to form insoluble calcium soap. The liquid is separated for recovery of glycerine. The calcium soap is boiled with sodium carbonate solution and the soap salted out with sodium chloride as usual. The saponification is completed by use of a small quantity of caustic soda.—*Chim. et Industrie*, 26, 1152, 1931.

—o—

Antioxidants were added to soaps made from cottonseed oil, red oil, linseed oil, soya bean oil and others. The antioxidants used were phenol, thymol, resorcinol, hydroquinone, pyrogallic acid, salicylic acid, betanaphthol, anthracene, benzaldehyde, and vanillin. After one year, the amount of oxidized fatty acid in the soap was determined. In order of effectiveness, thymol and phenol were first and second, followed by betanaphthol and hydroquinone.—*Jour. Soc. Chem. Ind. Japan, Supp. Binding*, 449, 1931.

—o—

An ingredient of lubricating grease is a metallic soap made from lead monoxide which has reacted with fatty acids of fish oil in a proportion of 1.5 mol. proportions of the oxide for each molecular proportion of fatty acid. It is used with a petroleum base to form special lubricating grease.—U. S. Patent No. 1,830,984.

A soap suitable for use with sea water or other hard waters is made by incorporating in a regular soap, produced from oils or fats and caustic soda, about 20% of a fatty acid-amine soap such as one formed from coconut oil, fatty acid and triethanolamine.—U. S. Patent No. 1,833,899.

—o—

Discoloration of toilet soaps resulting from the perfuming compounds added is due in certain specific cases to the following: artificial musk, coumarin, benzophenone, benzylideneacetone, meta and para cresol esters, methylnaphthyl ketone, phenyl acetic acid, indol, skatol, cinnamic alcohol and its esters.—*Seif. Zeitg.* 58,653, 1931.

—o—

A combination odor and germicidal compound for the production of a carbolic toilet soap is given as follows: pure phenol, 35 parts; methyl salicylate, 15 parts; cresylic acid, 10 parts; bornyl acetate, 10 parts; benzyl acetate, 15 parts; oil peppermint, 2.5 parts; naphthalene, 2.5 parts; linalool, 5 parts; resinous fixative, 10 parts; musk xylol, 5 parts.—*Soap Trade & Perf. Rev.*, Jan., 1932, 170.

—o—

There are three kinds of rancidity, or fat deterioration, although the process of decomposition and the end products vary widely. They are 1, oxidative; 2, hydrolytic; 3, ketonic rancidity. The first is due to the addition of oxygen to unsaturated glycerides to form peroxides and oxides which later break down to form aldehydes, ketones, and fatty acids. Hydrolytic rancidity is due to hydrolysis of glycerides to form fatty acids. This is an important form of spoilage in dairy products. The third form, or ketonic rancidity, is common in fats containing nitrogenous impurities, such as coconut oil, and results from the action of molds on certain lower fatty acids with the production of methyl ketones. — *Cereal Chemistry*, 8, 518, 1931; *Chem. Abstr.*, 26, 1462.

—o—

A composition for removing the tarnish from silver is made from finely divided zinc, and a solid acid salt such as sodium or potassium acid tartrate, and copper oxide. This is a dry mixture used with a damp cloth.—U. S. Patent No. 1,836,908.

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RECORD OF TRADE-MARKS

The following trade-marks were published in the March issues of the *Official Gazette* of the United States Patent Office in compliance with Section 6 of the Act of September 20, 1905, as amended March 2, 1907. Notice of opposition must be filed within thirty days of publication. As provided by Section 14, fee of ten dollars must accompany each notice of opposition.

Trade Marks Filed

Sea-Clean—This in solid letters describing soap. Filed by Henry T. Lawson, Atlanta, Dec. 11, 1931. Claims use since Sept. 16, 1931.

Tri-Mul—This in solid letters describing cleansing compound. Filed by Warner Chemical Co., New York, Jan. 5, 1932. Claims use since Dec. 18, 1931.

Oreon—This in outline letters with drawing of female head, describing shampoo soap. Filed by Oreon Shampoo Co., Chicago, Jan. 9, 1932. Claims use since Dec. 1, 1931.

Bourjois—This in solid letters on wood-cut of female figure, describing soap. Filed by Bourjois, Inc., New York, Jan. 23, 1932. Claims use since 1910.

Mothicide—This in solid letters describing liquid insecticide. Filed by Idico Corp., New York, Nov. 14, 1929. Claims use since Mar. 5, 1927.

Vapo-Dust—This in solid letters describing insecticide. Filed by California Spray-Chemical Corp., Berkeley, Nov. 7, 1931. Claims use since Oct. 15, 1931.

Bilmar—This in script describing moth-proofing preparation. Filed by William E. Wilson, Philadelphia, Dec. 15, 1931. Claims use since Oct. 16, 1931.

Fleeg—This in block letters on reverse plate describing insecticide. Filed by K. B. Chemical Co., Providence, R. I., Dec. 28, 1931. Claims use since May 9, 1931.

Kahn-Sen-Trate—This in solid letters on retort describing soaps and cleaning powders. Filed by Kahn Chemical Co., New York, May 25, 1931. Claims use since Jan. 10, 1929.

Gold Brick—This in solid letters describing metal polish. Filed by Chester G. Wise, Minneapolis, Jan. 25, 1932. Claims use since Jan. 2, 1932.

Bug Scat—This in solid letters together with drawing of cat and two insects, describing insecticide. Filed by Knox Chemical Co., St. Petersburg, Fla., July 8, 1931. Claims use since June 20, 1931.

Go-Devil—This in solid letters describing liquid insecticide and cleaner. Filed by Liquid Veneer Corp., Buffalo, Sept. 2, 1931. Claims use since Aug. 1, 1931.

Orphos—This in solid letters describing tooth paste. Filed by Walter Janvier, Inc., New York, Sept. 23, 1931. Claims use since Sept. 3, 1925.

Fly-Bane—This in outline letters describing insecticides. Filed by Alexander Drug Co., Oklahoma City, Okla., Oct. 15, 1931. Claims use since July 12, 1912.

Zev—This in solid letters describing antiseptic solution. Filed by Zev Pharmacal Co., Alton, Ill., Nov. 2, 1931. Claims use since June 1, 1931.

Illustration of nurse describing antiseptic and disinfectant. Filed by J. Hubbard & Co., Boston, Nov. 27, 1931. Claims use since Oct., 1902.

Tulco—This in solid letters describing tooth powder. Filed by Tulco Laboratories, Tulsa, Okla., Jan. 7, 1932. Claims use since Sept. 28, 1931.

Fulton's A-1—This in solid letters describing insecticides. Filed by Plantabbs Corp., Baltimore, Jan. 21, 1932. Claims use since Nov. 10, 1931.

Olo—This in shaded letters, arranged vertically and horizontally in form of cross, describing powdered and paste soap and cleaning compound. Filed by Beaver Chemical Works, Beaver Dam, Wis., Feb. 14, 1930. Claims use since May 1, 1928.

Sunny Monday—This in solid letters on wrapper describing soap. Filed by Gold Dust Corp., New York, Dec. 16, 1931. Claims use since Sept. 11, 1923.

Fanciful figure in form of clothespin describing soap. Filed by Gold Dust Corp., New York, Dec. 16, 1931. Claims use since Sept. 11, 1923.

Instant—This on cross-shaped reverse plate describing powdered cleaner. Filed by Instant Sales Co., Philadelphia, Jan. 11, 1932. Claims use since Sept. 29, 1931.

Exo—This in solid letters describing cleaning and polishing compound. Filed by Silver Suds Mfg. Co., Philadelphia, Jan. 18, 1932. Claims use since Dec. 31, 1931.

Re-Juv-Nal—This in solid letters describing cleaning compound. Filed by Hillyard Chemical

Co., St. Joseph, Mo., Jan. 22, 1932. Claims use since Sept. 1, 1931.

All-Water-Soap—This in solid letters describing soap. Filed by Lightfoot Schultz Co., Hoboken, N. J., Jan. 23, 1932. Claims use since Dec. 19, 1931.

Siren—This in solid letters describing soaps and polishes. Filed by S. H. Kress & Co., New York, Jan. 30, 1932. Claims use since Jan. 2, 1932.

Septi-San—This in solid letters describing antiseptic powder. Filed by Griffith-Lothrop Co., Portland, Ore., Mar. 30, 1931. Claims use since Jan. 26, 1931.

"Serrid"—This in solid letters describing insecticides, disinfectants and derris root. Filed by Derris, Inc., New York, Dec. 21, 1931. Claims use since Nov. 12, 1931.

Bif—This in solid letters describing insecticidal sprays. Filed by Union Oil Co. of California, Los Angeles, Jan. 11, 1932. Claims use since Oct. 27, 1931.

Nip-an-Tuck—This in solid letters describing roach powder. Filed by Huntington Laboratories, Inc., Huntington, Ind., Jan. 30, 1932. Claims use since August, 1920.

Ideal—This in solid letters describing soap powder and chips. Filed by Wilkinson, Gaddis & Co., Newark, Dec. 30, 1930. Claims use since 1887.

Holly—This in solid letters together with holly wreath describing cleaning preparation. Filed by Holly Chemical Co., Los Angeles, Nov. 23, 1931. Claims use since 1919.

Brushless—This in solid letters together with seal bearing words, "United Blades," describing shaving cream. Filed by United Razor Blade Corp., Chicago, Jan. 30, 1932. Claims use since Jan. 24, 1932.

Drawing of pyramids and Sphinx, describing moth proofing solution. Filed by Egyptian Mothproofing Co., Hollywood, Cal., Aug. 21, 1931. Claims use since Sept. 15, 1928.

Belaseptine—This in solid letters describing antiseptic and deodorant. Filed by Pinetrine Co., New York, Dec. 23, 1931. Claims use since Oct. 26, 1926.

Auttenberry's Mystery Killer—This in solid letters with drawing of knight in armor describing roach exterminator. Filed by William R. Auttenberry, Bowie, Tex., Dec. 24, 1931. Claims use since Oct. 25, 1931.

Waites—This in script on package carton describing tooth paste. Filed by Antidolor Mfg. Co., Springville, N. Y., Feb. 8, 1932. Claims use since November, 1913.

Lucky-Shave—This in solid letters describing shaving cream. Filed by Robot Razor Blade Corp., New York, Dec. 1, 1931. Claims use since Nov. 1, 1931.

Oak Ridge—This in solid letters describing shaving cream and soap. Filed by Sam Glass, Wauwatosa, Wis., Jan. 27, 1932. Claims use since Jan. 22, 1932.

X-Ray—This in block letters on reverse plate, with sketch of man with spray gun, describing insecticide, disinfectant and deodorant. Filed by X-Ray Insecticide Laboratories, New York, Sept. 5, 1930. Claims use since Aug. 1, 1928.

Farmasol—This in solid letters describing saponified cresol solution. Filed by Lysol, Inc., Bloomfield, N. J., Jan. 29, 1932. Claims use since Dec. 29, 1931.

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Trade Marks Granted

292,003. Liquid Wax. American Disinfecting Co., Sedalia, Mo. Filed September 15, 1931. Serial No. 319,055. Published December 1, 1931. Class 16.

292,004. Preparation for Cleaning and Polishing Lacquered Surfaces. Johnson Robbins Co., Gloversville, N. Y. Filed September 17, 1931. Serial No. 319,142. Published December 1, 1931. Class 16.

292,032. Soap. W. F. Young, Inc., Springfield, Mass. Filed November 9, 1931. Serial No. 320,962. Published December 15, 1931. Class 4.

292,035. Cleansing Fluid, Soap, Etc. The Fair, Chicago. Filed October 3, 1930. Serial No. 306,382. Published December 15, 1931. Class 4.

292,043. Soap. Warren Soap Mfg. Co., Boston. Filed October 30, 1931. Serial No. 320,652. Published December 22, 1931. Class 4.

292,060. Castile Soap. Earnshaw Knitting Co., Newton, Mass. Filed September 5, 1931. Serial No. 318,774. Published December 15, 1931. Class 4.

292,064. Liquid Soap. Apex Products Corp., Chicago. Filed August 12, 1931. Serial No. 317,886. Published December 15, 1931. Class 4.

292,100. Washing Compound. C. H. Chemical Co., Danville, Va. Filed October 7, 1931. Serial No. 319,833. Published December 1, 1931. Class 4.

292,101. Soap. Kirkman & Son, Inc., Brooklyn. Filed October 7, 1931. Serial No. 319,823. Published December 8, 1931. Class 4.

292,104. Washing Powders. Gold Dust Corp., New York. Filed October 6, 1931. Serial No. 319,774. Published December 22, 1931. Class 4.

292,105. Dry Cleaner. A. Packard Lobeck, doing business as One Hundred Per Cent Products, Coral Gables, Fla. Filed September 23, 1931. Serial No. 319,329. Published December 22, 1931. Class 4.

292,106. Cleansing Compound. Philadelphia Quartz Co., Philadelphia. Filed September 15,

1931. Serial No. 319,093. Published December 8, 1931. Class 4.

292,107. Automobile Cleaner. Weatherpruf Specialty Co., Chicago. Filed September 14, 1931. Serial No. 319,053. Published December 8, 1931. Class 4.

292,129. Soap. Borst Engineering, Inc., Buffalo. Filed October 30, 1931. Serial No. 320,627. Published December 8, 1931. Class 4.

292,130. Castile Soap. Earnshaw Knitting Co., Newton, Mass. Filed September 5, 1931. Serial No. 318,773. Published December 15, 1931. Class 4.

292,131. Castile Soap. Earnshaw Knitting Co., Newton, Mass. Filed September 5, 1931. Serial No. 318,772. Published December 15, 1931. Class 4.

292,132. Liquid Polish. E. J. Woodison Co., Detroit. Filed September 4, 1931. Serial No. 318,757. Published December 8, 1931. Class 16.

292,178. Floor Wax. Congoleum-Nairn Inc., Kearny, N. J. Filed May 20, 1931. Serial No. 314,791. Published July 14, 1931. Class 16.

292,179. Wax Polishes. Kelco Mfg. Co., Paterson, N. J. Filed July 13, 1931. Serial No. 316,892. Published December 8, 1931. Class 16.

292,196. Powdered Soap. N. Goodman & Son, New York. Filed May 31, 1930. Serial No. 301,-904. Published December 8, 1931. Class 4.

292,231. Dentifrices. Viviny Laboratories, West Haven, Conn. Filed June 16, 1931. Serial No. 315,949. Published December 22, 1931. Class 6.

292,256. Insecticide. Nyrda Products Co., New York. Filed October 17, 1931. Serial No. 320,203. Published December 22, 1931. Class 6.

292,268. Shampoo. Schieffelin & Co., New York. Filed December 15, 1930. Serial No. 309,-004. Published June 16, 1931. Class 6.

292,274. Preparation for Ridding Birds of Lice. Midway Chemical Co., Chicago. Filed September 24, 1931. Serial No. 319,366. Published December 8, 1931. Class 6.

292,275. Antiseptic. H. & W. Laboratories, Philadelphia. Filed September 26, 1931. Serial No. 319,446. Published December 8, 1931. Class 6.

292,333. Insecticides. California Spray-Chemical Corp, Berkeley, Calif. Filed November 10, 1931. Serial No. 320,973. Published January 5, 1932. Class 6.

292,357. Antiseptic. William H. H. Richardson, New Orleans. Filed September 15, 1931. Serial No. 319,231. Published December 22, 1931. Class 6.

292,374. Liquid Soap Dispenser. Hillyard Chemical Co., St. Joseph, Mo. Filed November 6,

(*Turn to Page* 51)

New Patents

Conducted by
Lancaster, Allwine & Rommel
Registered Attorneys
PATENT AND TRADE-MARK CAUSES
815 15th St., N. W., Washington, D. C.

Complete copies of any patents or trade-mark registrations reported below may be obtained by sending 25c for each copy desired to Lancaster, Allwine and Rommel. Any inquiries relating to Patent or Trade-mark Law will also be freely answered by these attorneys.

No. 1,843,316, Detergent, Patented February 2, 1932, by Karl Daimler, Hochst-on-the-Main, Germany, assignor to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany. A detergent product in solid form consisting of 200 parts by weight of sodium butylnaphthalene sulfonate, 50 parts by weight of dipentene and 180 parts by weight of calcined sodium carbonate.

No. 1,843,332, Insecticide, Patented February 2, 1932, by Karl Marx and Hans Wesche, Dessau in Anhalt, Germany, assignors to Winthrop Chemical Company, Inc., New York, N. Y. An insecticide containing as an active constituent an aliphatic ester of oxalic acid.

No. 1,844,290, Method of Manufacturing Relatively Noninflammable Cleaning Fluids, Patented February 9, 1932, by Robert Lungstras, St. Louis, Mo. A method of reducing the inflammability of solvent, which consists in impregnating the gasoline with nitrogen, at a temperature of approximately 2,500 degrees Fahrenheit.

No. 1,845,059, Disinfectant, Patented February 16, 1932, by Theodor Sabalitschka, Berlin-Steglitz, Germany. A disinfecting and preservative agent containing as an active constituent acetanisidine.

No. 1,845,461, Process for Rendering Odorless Soaps Bleached with Hypochlorous Acid, Patented February 16, 1932, by Adolf Welter, Krefeld-Rheinhafen, Germany. Process for removing the odor from soap bleached with hypochlorous acid consisting in heating the bleached soap under pressure with small quantities of excess alkali.

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Minority stockholders of Owl Drug Co. have filed suit in the California Superior Court against Drug, Inc., Louis K. Liggett Co., United Drug Co. and the directors of Owl Drug Co., Louis K. Liggett Co. and United Drug Co. The basis for the action is alleged mismanagement of Owl Drug Company's properties. The latter company is about to become insolvent according to the suit.

CONTRACTS AWARDED

R. M. Hollingshead Co., Camden, N. J., bid 4.29c. on 16,000 cans mechanic's hand soap in a recent Philadelphia U. S. Marine Corps bidding, this bid being recommended for acceptance. Another bid recommended for acceptance was one of 4c. on 6,000 cakes stove polish, made by Joseph Dixon Crucible Co., Jersey City, N. J.

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Julius Rothschild & Co., and John Rothschild & Co., San Francisco, have been awarded several contracts for the supply of soaps, shaving cream and tooth powder for the Fort Mason, California quartermaster, in a recent bidding.

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George E. Marsh & Co., Lynn, Mass., has been awarded the contract to supply the Staten Island U. S. Army Procurement Division with 60,000 lbs. fresh water soap at a price of 2.78c. delivered. Other bids and bidders follow: J. Eavenson & Sons, Camden, N. J., 3.14c.; Swift & Co., East Cambridge, Mass., 3.67c.; Colgate-Palmolive-Peet Co., Jersey City, 3.05c.; Palmer & Co., Bergen, N. J., 3.306c.; Procter & Gamble Co., Port Ivory, 3.41c.; Lysander, Kemp & Sons, Cambridge, 2.8c.; and John T. Stanley Co., New York, 3.5c.

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The 2.89c. bid of George E. Marsh Co., Lynn, Mass., on 50,000 lbs. laundry soap for Philadelphia U. S. Marine Corps has been recommended for acceptance. Other bids by the same concern of 2.49c. on 95,000 lbs. laundry soap and 4.59c. on 4,688 lbs. toilet soap were also recommended for acceptance. Other bids recommended for acceptance were as follows: 55,000 lbs. laundry soap, Newell Gutradt Co., San Francisco, 2.49c.; 40,000 lbs. soap powder, Armour & Co., Chicago, 2.3c.; 5,000 lbs. grit soap, Stevens Soap Corp., New York, 3.7c.; 1,400 cans saddle soap, Crystal Soap & Chemical Co., Philadelphia, 8.9c.; 27,500 lbs. grit soap, Hunnewell Soap Co., Washington, 2.9c.; 5,500 lbs. trisodium phosphate, Crystal Soap & Chemical Co., 8.8c.; and 20,000 cans metal polish, R. M. Hollingshead Co., Camden, N. J., 5.96c. No definite recommendation was made on 3,600 lbs. automobile soap.

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Colgate-Palmolive-Peet Co., Berkeley, Cal., was awarded the contract for a quanity of soap chips for Fort Mason, Cal., quartermaster in a recent bidding. The successful bid was 3.7c. Another award was made to Henry C. Hacke, San Francisco, on a quantity of laundry soda at 1.75c.

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Trade Marks Awarded

(*From Page* 49)

1931. Serial No. 320,866. Published January 5, 1932. Class 13.

292,411. Insecticides. Lakewood Manufacturing Co., Chicago. Filed September 22, 1930. Serial No. 305,954. Published December 22, 1931. Class 6.

292, 454. Soaps. D'Orsay Perfumeries Corp., New York. Filed October 21, 1931. Serial No. 320,330. Published January 5, 1932. Class 4.

292,468. Cleansing and Scouring Compound. Solvay Process Co., Syracuse, N. Y. Filed May 14, 1931. Serial No. 314,585. Published December 29, 1931. Class 4.

292,470. Tooth Paste. Worcester Salt Co., New York. Filed April 28, 1931. Serial No. 313,945. Published December 22, 1931. Class 6.

292,491. Insecticides. Corneli Seed Co., St. Louis. Filed August 14, 1931. Class No. 317,972. Published December 22, 1931. Class 6.

292,497. Fly Repellent. American Turpentine & Tar Company, Ltd., New Orleans, La. Filed July 23, 1931. Serial No. 317,236. Published December 22, 1931. Class 6.

292,498. Dentifrice. Alexander A. Petit, New Bedford, Mass. Filed July 21, 1931. Serial No. 317,192. Published December 22, 1931. Class 6.

292,499. Soaps. Lanman & Kemp-Barclay & Co., New York. Filed November 17, 1931. Serial No. 321,207. Published January 5, 1932. Class 4.

292,500. Soaps. Lanman & Kemp-Barclay & Co., New York. Filed November 17, 1931. Serial No. 321,208. Published January 5, 1932. Class 4.

292,527. Toothpaste. Tefra Co., Wilmington, Filed October 23, 1931. Serial No. 320,382. Published December 22, 1931. Class 6.

292,539. Saddle Soap. Gemsco, Inc., New York. Filed July 21, 1931. Serial No. 317,170. Published January 5, 1932. Class 4.

292,540. Cleaner, Polisher. Duraglaze Co., Chicago. Filed August 17, 1931. Serial No. 318,061. Published January 5, 1932. Class 4.

292,541. Cleaning Compounds. F. & P. Chemical Corp., New York. Filed August 31, 1931. Serial No. 318,587. Published January 5, 1932. Class 4.

Market Report on

ESSENTIAL OILS AND AROMATICS

(*As of April* 8, 1932)

NEW YORK—The market for essential oils and aromatic chemicals was a quiet and routine affair this month, featured by a number of minor price reductions. The only new development of any importance was the increasing activity of the Italian bergamot oil consortium which is expected to announce a price schedule for this oil shortly. What the effect of this group will be when it finally swings into action is still the subject of speculation. Quotations on bergamot oil were somewhat firmer this period. Bourbon geranium oil has now eased off somewhat from the peak price reached following reports of crop damage. Conflicting reports are still prevalent as to the actual extent of the damage. Anise and cassia were reduced moderately in a quiet market.

Oil Anise

Oil anise quotations were moderately lower this period as a result of lower replacement costs. Quotations as low as 36c lb. were current in some quarters. The far-eastern situation has quieted down in recent weeks, making buyers more sanguine as to future deliveries.

Oil Cassia

This oil was in much the same situation as anise, being quoted slightly lower on spot and for future delivery. Buyers were inactive, awaiting further concessions on later shipments.

Oil Bergamot

A somewhat firmer sentiment was noted in bergamot oil this period as arrangements for the operation of the Italian bergamot consortium in this market progressed. It is expected that a revised price schedule will appear shortly and that sales will be more closely controlled by the official agency. The actual plans for operation of the consortium have not as yet been made known.

OIL GERANIUM

Conflicting reports are still current as to the extent of the damage caused by the recent typhoon on the island of Reunion. The report of a short crop is still accepted in some quarters, although this is counteracted in others by the opinion that large users have as yet shown no tendency to increase their holdings. It is generally agreed that the stock of oil in the local market is not large. During the past four weeks slightly lower prices have been named on Bourbon oil than were quoted following the storm report. The Algerian oil is in firmer position at the moment, due to the pressure of higher cables recently received.

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The price list and catalog of Dodge & Olcott Co., New York, for April and May, 1932, has been issued, and is available for distribution.

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A price list of aromatic products has been issued by Givaudan-Delawanna, Inc., with quotations as of March, 1932.

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Northern Blower Co., Cleveland, has issued a folder describing changes and improvements recently made in "Norblo" dust filters.

Drug Dinner Attendance Breaks Record

Over seven hundred guests attended the annual banquet of the Drug, Chemical and Allied Trades Section of the New York Board of Trade, held at the Commodore Hotel, New York, March 15. P. C. Magnus, chairman of the section, presided, and outlined the work of the section over the past year. R. D. Keim acted as toastmaster and introduced as speakers, Gilbert T. Hodges of the *New York Sun*, Lowell Thomas and Julius Tannen. B. J. Gogarty acted as chairman of the reception committee.

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Reports from the U. S. Department of Commerce office in Rio de Janeiro state that 1,332 sacks of Russian soda ash and 666 drums of Russian caustic soda have recently been imported into Brazil.

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Tidy Products Incorp., Chrysler Bldg., N. Y., have issued a booklet describing various uses for their "Truly Safe" tilt trucks. The equipment is designed to facilitate the handling of barrels, drums and carboys.

—o—

Stokes & Smith Co., Philadelphia, are mailing a folder presenting the desirable features of the tight-wrapped package.

Market Report on

SOAP AND DISINFECTANT CHEMICALS

(*As of April* 8, 1932)

NEW YORK—Price changes were somewhat more numerous in the market for soap and disinfectant chemicals this period. The changes were, in almost every case, revisions to lower levels. The outstanding reduction came in borax and boric acid where competition has been especially severe. Glycerine prices were also the object of competition, foreign offers disrupting the market and bringing lower quotations during the past month. Little activity was noted in the rosin market, with shipments continuing fairly good and prices fluctuating between narrow margins.

ALKALIS

Producers reported a routine business during the period just closed. Activity was confined mainly to the filling of contract orders, with the spot market very quiet. Quotations show no change.

BORAX AND BORIC ACID

Borax producers have reduced prices substantially during the past few weeks, this movement being followed by an even more sharp drop in the price of boric acid. The reductions in price are attributed to a severe competitive battle.

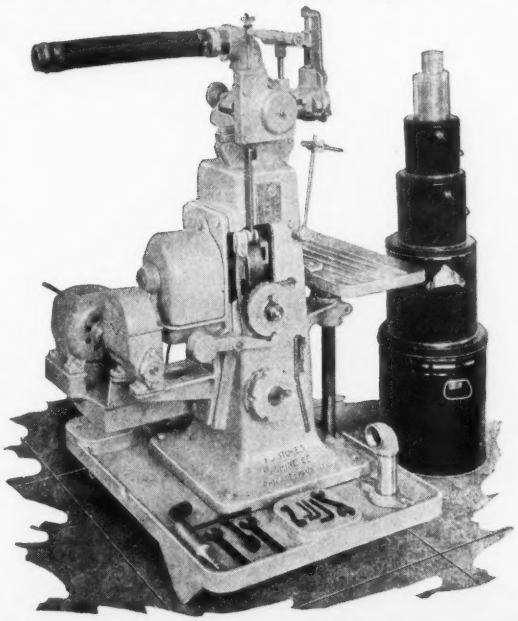
GLYCERINE

An influx of foreign offers of chemically pure glycerine at reduced prices resulted in extended price reductions in the glycerine market this period. The other grades followed the downward movement sympathetically. Current quotations now are: chemically pure, 10¾ to 11c lb.; dynamite, 8 to 9½c; saponification, 5½ to 5¾c; and soapslye, 4⅛ to 4¼c.

NAVAL STORES

Market quotations on wood and gum rosin this month moved between very narrow limits. The general price tone of the market was weaker, although reductions in price were of minor im-

portance. Movements from southern ports continued heavier than the corresponding figures for last year, with a further reduction in stocks. The closing schedule follows: Gum Rosin, Grade B, $3.25; H, $4.05; K, $4.50; N, $5.85; WG, $5.95; WW, $6.00; Wood, $3.83 to $4.03.



A new filling machine manufactured by F. J. Stokes Machine Co., Philadelphia, which is said by them to have solved the problems of quick cleaning and quick change of container. According to the makers, only ten minutes are required for change of material and but two minutes for change of container. The machine fills liquids into cans, jars or tubes from one-quarter pint up to five gallons.

To Act as Ohio Sales Representative

Fred H. Palmer, Jr., 850 Euclid Avenue, Cleveland, has made arrangements to represent several soap and insecticide raw material concerns in the Ohio territory. Among these companies are Bopf-Whittam Corp., Westfield, New Jersey, lanoline and wool grease, Colgate-Palmolive-Peet Co., Chicago, glycerin, Glyco Products Co., Brooklyn, specialties for soaps, polishes, etc., Kollmorgen Optical Corp., Brooklyn, manufacturers of a drum inspecting device, McCormick & Co., Baltimore, pyrethrum, Potters Mining & Milling Co., East Liverpool, Ohio, silica, Standard Aromatics, Inc., Brooklyn, perfuming materials and Vulcan Stamping & Manufacturing Co., tin cans and steel pails. Mr. Palmer has acted as Ohio representative for several companies in the chemical industry during the past few years and has just broadened his line to include a number of items of particular interest to manufacturers of soaps, insecticides, disinfectants, etc.

Market Report on

TALLOW, GREASES AND OILS

(*As of April* 8, 1932)

NEW YORK—The market for soapmaking oils, fats and greases again took a downward turn during the period just closed, reversing the movement of the previous period. A whole series of price declines were noted, some of substantial proportions, affecting almost every item in the list. Coconut oil was quoted lower in all markets, and coast quotations for copra also dropped. Substantial reductions occurred in the price of cottonseed oil, this oil being affected most severely by fresh recessions in the security and commodity markets. Tallow was offered at lower prices both here and in London early in the period, although the market regained a more steady tone latterly. Stocks of oils and fats in the hands of soap makers are still believed to be heavy, although one large concern reported during the period that its inventory of raw materials was expected to be back at normal within the next few months.

Coconut Oil

Activity in the copra market was practically at a standstill this period, with buyers quoting lower offers and exhibiting a willingness to await further developments. Coconut oil also sold lower in all markets, finding little demand. The current quotation on New York tanks of Manila oil is 3⅝c to 3¾c lb.

Corn Oil

Corn oil declined sympathetically along with coconut and cottonseed oils, there being no pressure of offerings nor any buying interest.

Cottonseed Oil

Cottonseed oil quotations reached new lows for the season this period, the movement downward being accelerated by renewed weakness in the se-

curity and commodity markets. Southern markets were generally quiet with neither buyers nor sellers anxious to extend operations. Closing quotations found crude priced at 2¾c lb., with PSY oil at 3½c.

TALLOW

Tallow was down fractionally at the close of the period. Earlier in the month lower prices were quoted in London. Later an increase in interest on the part of buyers and lighter offerings restored a more steady tone. At the close city extra was steady at 2¾ to 2⅞c lb.

MISCELLANEOUS

Other items to share in the decline this period were lard, degras, grease and menhaden, peanut, tallow, lard and olive oils.

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National Dairy Union, Washington, has been warned by the Federal Trade Commission to stop supplying retail dealers with false statements purporting to be descriptive of the manufacture and sale of oleomargarine. The Union must also stop asserting that oleomargarine, in the ordinary course of manufacture, is foul, filthy or unsanitary.

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Ellis R. Meaker, president of Ivanhoe Foods, Inc., Auburn, N. Y., has been elected president of the Mayonnaise Manufacturers Association, following the resignation of William McKelden of the Atmore Co.

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A Cuban presidential decree which went into effect March 17 increased the rate of duty on coconut, corn, linseed, olive, palm kernel, soybean, peanut, sesame and other oils, as well as lard and lard compounds, for use exclusively in the manufacture of soap and paint.

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The naval stores department of Hercules Powder Co. has developed a new liquid resin which will be sold under the name Abalyn.

—o—

Alsop Engineering Corp., New York, has added to its catolog several pages on its new "Asbestos Disc Filters." These are now ready for distribution. Equipment of the company's test laboratory has been completed and a complete service on liquid handling problems is now available.

—o—

Ed Kratsch, secretary of the National Sanitary Supply Association, and publisher of *Janitation*, recently had a narrow escape from death in a bad automobile accident. Although painfully injured, he is now well on the road to recovery.

Certainly your Mother uses that Cleaner . . .

. . . *'most everybody does*

The one sure way to speed sales and pyramid resales of water softeners and cleaners is to formulate them with Aero Brand T-S-P. Original excellent mechanical condition is carried through to consumer. Retailers are glad to boost first sales for your improved goods. Resales mount. You profit from increased sales and reduced selling resistance.

Aero Brand fines and crystals are carefully cured and precisely screened. All possible moisture absorption is eliminated in our processing and packing. Strength and purity run uniform through repeated shipments. Aero Brand T-S-P is invariably free-flowing. It dissolves quickly.

Packed in non-sifting, paper-lined containers Aero Brand reaches you in the best possible condition. The location of our plants at Warners, New Jersey, on New York Harbor, assures prompt shipments by water, rail or truck. Let us quote you.

T·S·P

Industrial Chemicals Division

American Cyanamid Company

535 Fifth Avenue New York

Say you saw it in SOAP!

CURRENT PRICE QUOTATIONS

As of April 9, 1932

Chemicals

Acetone, C. P., drums	lb.	.10	.11
Acid, Boric, bbls., 99½%	ton	95.00	100.00
Cresylic, 97% dk., drums	gal.	.42	.43
97-99%, pale, drums	gal.	.49	.53
Formic, 90%, tech	lb.	.10½	.12
Oxalic, bbls	lb.	.11	.11¼
Adeps Lanae, hydrous, bbls	lb.	.14	.15
Anhydrous, bbls	lb.	.15	.16
Alcohol, Ethyl, U. S. P., bbls	gal.	2.45	2.59
Complete Denat., No. 5, drums., ex.	gal.	.35½	.43½
Alum. potash lump	lb.	.03	.03¼
Ammonia Water, 26°, drums, wks	lb.	.02½	.02¾
Ammonium Carbonate, tech., bbls	lb.	.08	.12½
Bleaching Powder, drums	100 lb.	1.75	2.35
Borax, pd., cryst., bbls., kegs	ton	50.00	55.00
Carbon Tetrachloride, car lots	lb.	—	.06¼
L. C. L.	lb.	.06½	.07
Caustic, see Soda Caustic, Potash Caustic			
China Clay, filler	ton	10.00	25.00
Cresol, U. S. P., drums	lb.	.10½	.11
Creosote Oil tanks	gal.	.11½	.12½
Formaldehyde, bbls	lb.	.06	.07
Fullers Earth	ton	15.00	24.00
Glycerine, C. P., drums	lb.	.10¾	.11
Dynamite, drums	lb.	.08	.09½
Saponification, tanks	lb.	.05½	.05¾
Soaps, Lye, tanks	lb.	.04⅛	.04¼
Hexalin, drums	lb.	—	.30
Kieselguhr, bags	ton	—	35.00
Lanolin, see Adeps Lanae.			
Lime, live, bbls	per bbl.	1.70	2.20
Mercury Bichloride, kegs	lb.	.93	1.08
Naphthalene, ref. flakes, bbls	lb.	.03¾	.05
Nitrobenzene (Myrbane) drums	lb.	.09½	.11
Paradichlorbenzene, bbls., kegs	lb.	.15	.23
Paraformaldehyde, kegs	lb.	.38	.39
Petrolatum, bbls. (as to color)	lb.	.01⅞	.06¾
Phenol, (Carbolic Acid), drums	lb.	.14¼	.16
Pine Oil, bbls	gal.	.61	.66
Potash, Caustic, drums	lb.	.06⅛	.06⅜
Flake	lb.	.07	.08
Potassium Bichromate, casks	lb.	.08	.08½
Pumice Stone, powd	100 lb.	2.50	4.00
Rosins (600 lb. bbls. gross for net)—			
Grade B to H. basis 280 lbs	bbl.	3.25	4.05
Grade K to N	bbl.	4.50	5.85
Grade WG and WW	bbl.	5.95	6.00
Wood	bbl.	3.83	4.03
Rotten Stone, pwd. bbls	lb.	.02½	.04½
Silica, Ref., floated	ton	18.00	22.00
Soap, Mottled 40 lb. box	lb.	—	.12
Olive Castile, bars, powder	lb.	.12	.22
Powdered White, U. S. P.	lb.	.14	.16
Green, U. S. P.	lb.	.06½	.07½
Tallow Chips	lb.	.07½	.08
Whale Oil, bbls	lb.	.04	.04½
Soda Ash, contract, wks., bags, bbls.	100 lb.	1.12½	1.38
Car lots		—	1.00
Soda Caustic, Cont., wks., sld	100 lb.	—	2.50
Flake	lb.	—	2.90
Liquid. tanks	lb.	—	2.15
Soda Sal.. bbls	100 lb.	1.05	1.15
Sodium Chloride (Salt)	ton	11.40	14.00
Sodium Fluoride, bbls	lb.	.07½	.08½
Sodium Hydrosulphite, bbls	lb.	.22	.26
Sodium Silicate, 40 deg., drum, 100 lb.		.75	.80
Drums, 60 deg. wks	100 lb.	—	1.65
In tanks, 15c. less per hundred, wks.			
Tar Acid Oils, 15-25%	gal.	.21	.25
Trisodium Phosphate, bbls	lb.	.03	.03½
Zinc Oxide, lead free	lb.	.06	.06¼
Zinc Stearate, bbls	lb.	.16	.18

Oils—Fats—Greases

Castor, No. 1, bbls	lb.	.10¾	.11
No. 3, bbls	lb.	.10¼	.10½
Coconut, tanks, N. Y.	lb.	.03⅝	.03¾
Tanks, Pacific Coast	lb.	.03¼	.03⅜
Tanks, Chicago	lb.	.03⅞	.04
Cod, Newfoundland, bbls	gal.	.25	.26
Copra, bulk, Coast	lb.	—	.02⅛
Corn, tanks, mills	lb.	.03¼	.03⅜
Bbls., N. Y.	lb.	.05	.05¼
Cottonseed, crude, tanks, mill	lb.	.02¾	.02⅞
PSY	lb.	.03½	.03⅝
Degras, Amer., bbls	lb.	.03	.04
English, bbls	lb.	.03¾	.04¼
German, bbls	lb.	.03⅜	.03½
Neutral, bbls.	lb.	.06¾	.08½
Greases, choice white, bbls., N. Y.	lb.	.03	.03½
Yellow	lb.	.02	.02⅛
House	lb.	.02	.02⅛
Lard, prime, steam, tierces	lb.	.04⅝	.04¾
Compound tierces	lb.	.05½	.06
Lard Oil,			
Extra, bbls.	lb.	—	.07¼
Extra, No. 1, bbls.	lb.	—	.07
No. 2, bbls.	lb.	—	.06½
Linseed, raw, bbls., spot	lb.	.0660	.0700
Tanks, raw	lb.	—	.0600
Boiled, 5 bbls. lots	lb.	—	.0780
Menhaden, Crude, tanks, Balt.	gal.	—	.15½
Oleo Oil, No. 1, bbls., N. Y.	lb.	—	.06⅝
No. 2, bbls., N. Y.	lb.	—	.05⅞
Olive, denatured, bbls., N. Y.	gal.	.68	.70
Foots, bbls., N. Y.	lb.	.04½	.04¾
Palm, Lagos, casks, spot	lb.	.03¾	.04
Shipments	lb.	.03⅜	.03½
Niger casks, spot	lb.	.03¼	.03⅜
Shipments	lb.	—	.03⅛
Palm Kernel, casks, denatured	lb.	.05¼	.05½
Tank cars, denatured	lb.	—	.04⅞
Peanut, domestic tanks	lb.	.03¾	.04
Red Oil, distilled, bbls.	lb.	.06⅝	.07⅛
Saponified, bbls.	lb.	.06⅝	.07⅛
Tanks	lb.	—	.05¾
Soya Bean, domestic tanks, N. Y.	lb.	.03¼	.03¾
Stearic Acid			
Double pressed	lb.	.07½	.08
Triple pressed, bgs.	lb.	.10¼	.10¾
Stearine, oleo, bbls.	lb.	.03½	.04
Tallow, special. f. o. b. plant	lb.	.02½	.02¾
City, ex. loose, f. o. b. plant	lb.	.02¾	.02⅞
Tallow, oils, acidless, tanks, N. Y.	lb.	—	.06
Bbls., c/1, N. Y.	lb.	—	.06½
Whale, nat. winter, bbls., N. Y.	gal.	.53	.55
Blchd., winter, bbls., N. Y.	gal.	.56	.58
Extra blchd., bbls., N. Y.	gal.	.59	.61

As of April 9, 1932

Essential Oils

Almond, Bitter, U. S. P.	lb.	$2.25	$2.50
Bitter, F. F. P. A.	lb	2.50	2.75
Sweet, cans	lb	.40	.43
Apricot, Kernel, cans	lb.	.26	.28
Anise, cans	lb.	—	—
U. S. P., cans	lb.	.36	.39
Bay, tins		1.90	2.00
Bergamot, coppers	lb.	1.85	2.00
Artificial	lb.	1.35	1.50
Birch Tar, rect., bot.	lb.	.45	.50
Crude, tins	lb.	.13	.14
Bois de Rose, Brazilian	lb.	.60	.65
Cayenne	lb.	1.15	1.30
Cade, cans	lb.	.26	.27
Cajuput, native, tins	lb.	.54	.56
Calamus, bot.	lb.	2.75	3.00
Camphor, Sassy, drums	lb.	.21	.23
White, drums	lb.	.16	.18
Cananga, native, tins	lb.	1.75	1.90
Rectified, tins	lb.	2.20	2.30
Caraway Seed	lb.	1.55	1.65
Cassia, Redistilled, U. S. P.	lb.	1.05	1.10
drums	lb.	—	.98
Cedar Leaf, tins	lb.	.87	1.00
Cedar Wood, light, drums	lb.	.33	.36
Citronella, Java, drums	lb.	.49	.50
Citronella, Ceylon, drums	lb.	.33	.35
Cloves, U. S. P., cans	lb.	1.15	1.20
Eucalyptus, Austl., U. S. P., cans	lb.	.33	.35
Fennel, U. S. P., tins	lb.	1.00	1.10
Geranium, African, cans	lb.	4.40	5.00
Bourbon, tins	lb.	4.30	4.75
Hemlock, tins	lb.	.90	.95
Lavender, U. S. P., tins	lb.	1.85	3.50
Spike, Spanish, cans	lb.	.55	.75
Lemon, Ital., U. S. P.		1.10	1.40
Lemongrass, native, cans	lb.	.44	.45
Linaloe, Mex., cases	lb.	1.80	1.95
Neroli, Artificial	lb.	10.00	20.00
Nutmeg, U. S. P., tins	lb.	1.20	1.30
Orange, Sweet, W. Ind., tins	lb.	1.35	1.50
Italian cop.	lb	1.60	2.00
Distilled	lb.	.80	.90
Origanum, cans, tech.	lb.	.25	.40
Patchouli	lb.	3.75	5.50
Pennyroyal, dom.	lb.	1.55	1.60
Imported	lb.	1.10	1.15
Peppermint, nat. cases	lb.	1.50	1.70
Redis., U. S. P., cases	lb.	1.65	1.90
Petit Grain, S. A., tins	lb.	1.10	1.20
Pine Needle, Siberian	lb.	.60	.63
Rose, Natural	oz.	8.50	15.00
Artificial	oz.	2.00	2.75
Rosemary, U. S. P., drums	lb.	.39	.43
Tech., lb. tins	lb.	.32	.33
Sandalwood, E. Ind., U. S. P.	lb.	6.50	7.50
Sassafras, U. S. P.	lb.	1.00	1.20
Artificial	lb.	.27	.29
Spearmint, U. S. P.	lb.	1.40	1.55
Thyme, red, U. S. P.	lb.	.50	.65
White, U. S. P.	lb.	.85	.90
Vetivert, Bourbon	lb.	4.50	5.00
Java	lb.	16.00	20.00
Ylang Ylang, Bourbon	lb.	5.15	6.50

Aromatic Chemicals

Acetophenone, C. P.	lb.	$2.00	$3.00
Amyl Cinnamic Aldehyde	lb.	3.50	4.25
Anethol	lb.	1.20	1.40
Benzaldehyde, tech.	lb.	.60	.65
U. S. P.	lb.	1.20	1.35
Benzyl, Acetate	lb	.60	.95
Alcohol	lb.	.80	1.30
Citral	lb.	2.10	2.40
Citronellal	lb.	1.75	2.50
Citronellol	lb.	2.50	3.50
Citronellyl Acetate	lb.	4.50	7.00
Coumarin	lb.	3.60	4.00
Cymene, drums	gal.	.90	1.25
Diphenyl oxide	lb.	1.10	1.20
Eucalyptol, U. S. P.	lb.	.60	.70
Eugenol, U. S. P.	lb.	3.00	4.00
Geraniol, Domestic	lb.	1.45	2.00
Imported	lb.	2.00	3.25
Geranyl Acetate	lb.	2.50	4.00
Heliotropin, dom.	lb.	2.00	2.50
Imported	lb.	2.50	4.00
Hydroxycitronellal	lb.	3.50	9.00
Indol, C. P.	oz.	2.50	5.00
Ionone	lb.	4.00	6.50
Iso-Eugenol	lb.	4.00	5.00
Linalool	lb.	1.95	3.25
Linalyl Acetate	lb.	2.40	3.15
Menthol	lb.	3.35	3.50
Methyl Acetophenone	lb.	2.50	3.00
Anthranilate	lb.	2.20	2.60
Paracresol	lb.	4.50	6.00
Salicylate, U. S. P.	lb.	.40	.45
Musk Ambrette	lb.	6.75	7.25
Ketone	lb.	6.00	7.50
Moskene	lb.	5.40	5.90
Xylene	lb.	2.75	3.00
Phenylacetaldehyde	lb.	4.75	7.25
Phenylacetic Acid, 1 lb., bot.	lb.	3.00	4.00
Phenylethyl Alcohol, 1 lb. bot.	lb.	4.25	4.50
Rhodinol	lb.	6.00	9.50
Safrol	lb.	.29	.31
Terpineol, C. P., 1,000 lb. drs.	lb.	.28	.30
Cans	lb.	.33	.34
Terpinyl Acetate, 25 lb. cans	lb.	.80	.95
Thymol, U. S. P.	lb.	1.50	1.75
Vanillin, U. S. P.	lb.	4.50	5.75
Yara Yara	lb.	1.60	3.00
Insect powder, bbls.	lb.	.20	.22
Concentrated Extract	gal.	1.50	1.70
Gums—			
Arabic, Amb. Sts.	lb.	.06½	.07½
White, powdered	lb.	.12	.15
Karaya, powdered	lb.	.14	.16
Tragacanth, Aleppo, No. 1	lb.	.95	1.00
Sorts	lb.	.09	.14
Waxes—			
Bayberry, bgs.	lb.	.16	.18
Bees, white	lb.	.34	.38
African, bgs.	lb.	.14½	.15
Refined, yel.	lb.	.25	.30
Candelilla, bgs.	lb.	.14	.15
Carnauba, No. 1	lb.	.21½	.23
No. 2, Yel.	lb.	.20½	.22
No. 3, Chalky	lb.	.11	.11½
Japan, cases	lb.	.08½	.09½
Paraffin, ref. 125-130	lb.	.03⅜	.04⅛

Lathering Power of Soaps

(*From Page 27*)

nevertheless indicated. A purified cassein solution would, however, be preferable. The latter solution is made by boiling one kilo of casein with 150 grams of sodium hydroxide in 10 kilos of water until brown coloring occurs with ample evolution of ammonia. The boiling lasts about three hours. The solution is left to settle and a greenish slime deposits on the bottom. The upper clear liquid is milled directly in the soaps, or the liquid is evaporated and a brownish powder is obtained. Of the powder, which is made into a paste with glycerin, 1% even suffices to impart to the soap a strong lather with a very soft "feel." One can also obtain by various manipulations the pure soda salt of protalbinic acid from the casein solution of which also only a very small quantity suffices.

Miscellaneous Additives

SAPONINE which in itself in aqueous solutions, produces strong lather and suds when added to the extent of more than 1% rather hinders the lathering power of soap. On the other hand when adding 0.1% to 0.2% a certain increase in the lathering power could be noted. Gelatin, starch, tragacanth also in solution, when added in very small quantities, make the lather sometimes more dense and stable, but not stronger.

Finally it may be stated that sodium bicarbonate,—probably due to the influence of the developing carbonic acid, brings about a slight increase in the lathering power. In additions of more than 3%, however, a considerable deterioration in lather is noted.

Some of the agents, in connection with which we have shown that, in suitable quantity and when properly applied, have a lather-increasing action, can also be combined in order to increase lathering power. As a matter of fact, there can be used without fear, four or more of the mentioned lather-increasing agents, of course, reducing in this regard the individual quantities. In connection with all lather increasing agents, one must bear in mind that the selection of a fat charge with the greatest lathering power is by far the most important factor and that only a comparatively slight increase of the lathering power beyond that produced by the fat charge, is possible under any circumstances.

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Givaudan-Delawanna, Inc., New York, has issued in booklet form a report on investigations made by Donald A. Laird on the question, "How the Consumer Estimates Quality by Subconscious Sensory Impressions . . . with special reference to the sense of smell."

Oil & Fat Section

A section of SOAP devoted to oils, fats, waxes, and edible oil products, published prior to Jan. 1, 1932 as a separate magazine under the title, *Oil & Fat Industries*.

Higher Fatty Alcohols and Their Detergent Derivatives

By HANS LEDERER*

THE preparation of new, highly effective washing and wetting agents from the higher aliphatic alcohols represents a very important development in the organic chemical industry within the past two years. Inasmuch as there has not as yet appeared any publication which summarizes the various outstanding facts and information contained in the different patents and articles that have been published on this subject, affording an opportunity of establishing the present status of our knowledge on this subject, it was thought advisable to study the matter from this standpoint and publish the results.

The fatty alcohols were up to the present time, substances which were difficult to secure. The Bouveault reaction (Bouveault and Blanc, *Bulletin Societe Chimique*, Series 3, volume 31, page 616), which consists in reducing the corresponding acid ester in alcohol by means of metallic sodium to the primary alcohol, afforded only poor yields. The modification of this process, so that almost quantitative yields are obtained, was one of the problems that had to be solved.

H. Bertsch (*Melliands Textilberichte*, 1930, 779) and the H. Th. Boehme A.G., first made the carboxyl groups of the sulphonated oils inactive by converting them into the acid amide or into the acid ester. The carboxyl groups of these compounds cannot react with the lime salts of the water. In carrying out these investigations further, an effort was made to eliminate the carboxyl groups, which were considered as the cause of the bad properties of the soaps and sulphonated oils. An attempt was made to convert the carboxyl group into the hydroxyl group. Experiments were carried out to accomplish an improvement in the old Bouveault process according to French Patent No. 701-200 of H. Th. Boehme A.G. In accordance with this process, the alkyl esters of the fatty acids were reduced with the aid of sodium in alcoholic solution under a hydrogen pressure of fifteen to twenty atmospheres.

The corresponding alcohols are obtained in good yield by this process. The same company describes in British Patent No. 351,359 a process wherein the formation of alkyl esters of the fatty acids is avoided, inasmuch as the natural fatty glycerides can be reduced to a large extent by means of sodium to form alcohols. For example, 200 grams of coconut oil are dissolved in one liter of butyl alcohol and converted with the aid of 90 grams of metallic sodium in an autoclave which is filled with hydrogen gas. The reaction mixture is heated to about 100 C. Then the temperature is raised to 140 C. This results in almost quantitative yield of fatty alcohols, which can be easily separated by fractionation. In French Patent No. 696,131, assigned to the Chemnitz Fabrik there is described a process for the reduction of a large number of organic compounds. The reduction with sodium does not attack the double bonds of the carbon atoms, which is contrary to catalytic reduction, in which saturated alcohols are produced. Thus for example the reduction of castor oil with the aid of sodium yields octadecylene alcohol.

* In *Seifensieder Zeitung*, volume 59, pg. 13, 1932.

The process, which calls for the reduction of natural glycerides for the production of higher aliphatic alcohols, is, however, too expensive for plant scale operations. The problem of the technical synthesis of fatty alcohols has, however, been solved by catalytic hydrogenation. This has been rendered possible by the intensive study made during the past few years on catalysis by means of complex catalysts.

IT has been demonstrated that the catalytic conversion of the carboxyl group into the alcoholic hydroxyl group can be accomplished both without pressure in the vapor phase and also under a higher hydrogen pressure in the liquid phase. French Patent No. 689,713 of I. G. Farbenindustries A.G. describes the catalytic reduction of esters of carboxylic acids in vapor form by means of compound catalysts, whereby alcohols and hydrocarbons are obtained under different conditions. The conversion is directed into the proper direction by the proper choice of reaction temperature and catalyst. Thus ethyl alcohol can be obtained in good yield at a temperature of 270 C by conducting a mixture of 99 parts by volume of hydrogen and one part by volume of ethyl acetate over a copper-vanadium contact catalyst. The volatile alkyl esters of the higher fatty acids are converted in the same manner into the corresponding fatty alcohols in a current of hydrogen.

Copper chromite, which is prepared from cupric-ammonium chromate by thermal decomposition, has been found to be an excellent catalyst for the catalytic hydrogenation of organic substances, when used at pressures of 100 to 150 atmospheres. (*Chemische Zentralblatt*, 1931, I, 2856). Experiments carried out with the aid of compound catalysts were successful in the conversion of esters of aliphatic and fatty-aromatic acids in yields of eighty to ninety per cent into the corresponding alcohols. A pressure of 220 atmospheres and a temperature of 250 C are the best conditions. (*Chemische Zentralblatt*, 1931, I, 2856). Thus for example lauric acid is converted into lauryl alcohol, myristinic into myristyl alcohol and succinic acid into tetramethyleneglycol.

AN interesting article has been published in *Berichte*, volume 64, pages 1314-1318, by W. Schrauth, O. Schenck and K. Stickdorn on the production of hydrocarbons and alcohols by high pressure reduction of fatty substances. The authors investigated the hydrogenation of individual fatty acids, their esters of fatty acids and natural glycerides by means of single catalysts and mixed catalysts composed of copper, copper-zinc alloys, copper-chromium alloys and nickel in high pressure agitating autoclaves. The results obtained agreed with earlier experiments which showed that nickel leads very readily to the formation of hydrocarbons, while the reaction does not proceed any farther than the technically much more important fatty alcohols when the reduction is carried out with the aid of copper catalysts and substances containing copper.

The maintenance of certain temperature and pressure limits, up to 320 C and two hundred atmospheres, is also important. Experiments were also made with coconut oil, which is treated in an agitating autoclave in the presence of a catalyst (copper) precipitated on kieselguhr at a temperature of 325 C and 280 atmospheres pressure. The mixture of alcohols was obtained in the form of a water-white liquid which boiled between 70 and 215 degrees C. Under like conditions, the hydrogenation of stearic acid yielded pure octadecyl alcohol.

Other experiments along these lines were made by W. Norman (*Zeitschrift fuer angewandte Chemie*, volume 44, 1931, page 714). The glycerides were found to be easily hydrogenated. Copper, precipitated in metallic form on a kieselguhr carrier, or copper carbonate, was used as the catalyst. The experiments were carried out on coconut oil, coconut oil fatty acids, lauric acid, stearic acid, the methyl esters of coconut oil fatty acids, methyl oleate and the natural glycerides, linseed oil, peanut oil, sperm oil, palm oil, mustard seed oil and other oils, which were hydrogenated in an agitating autoclave at a temperature of 310 to 320 C and at 200 to 250 atmospheres of hydrogen gas. The yields were 97 per cent of theory at a maximum. The progress of the reaction was established by the determination of various coefficients, such as the ester number, the iodine number and the acetyl number. The latter coefficient is from 185 to 205 for the reduced oil, with the exception of castor oil. The iodine number lies around unity, which accordingly signifies that the double bonds have been almost completely saturated. The glycerin of the natural fats and oils is no longer recovered as such after the hydrogenation, but has been converted into propyl alcohol.

OTTO SCHMIDT (*Chemische Zentralblatt*, 1931, II, 2444) says that he effected the hydrogenation of the carboxyl groups in oils as early as 1925. He has published an article on the catalytic hydrogenation of the easily volatile, lower fatty acid alkyl esters in the gaseous phase and of the natural glycerides under pressure in the liquid phase. Attention must be called at this point to the excellent agreement between the results obtained by the various experimenters. Schmidt has described amongst others the synthesis of octadecyl alcohol from methyl oleate, wherein the ester is allowed to drop into a current of hydrogen gas at a temperature of 280 C without the application of pressure in the presence of a

copper-chromium catalyst. The yield varied between eighty and ninety per cent. Catalysis in the presence of cobalt in the liquid phases takes place at lower temperatures as low as 200 C. The hydrogenation of castor oil in a rotary autoclave, carried out in accordance with the described process, yields seventeen per cent of octadecyl alcohol and 75 per cent of octadecane glycol. These quantities correspond to the exact composition of the oil.

It must therefore be concluded that the hydrogenation in the vapor phase gives just as good results as in the liquid phase. However, from the technical standpoint the process, operated in the liquid phase, appears to be more economical, for in this case, the glycerides need not be esterified.

THE mechanism of the formation of the alcohol is simple in the case of the reduction of the free acids. Inasmuch as aldehyde cannot be detected at any time, it must be assumed that the acid is converted directly into the alcohol. The hydrogenation of the alkyl esters is, however, a complicated process. Two reactions take place simultaneously, the hydrogenation reaction (I) and the thermal decomposition of the ester (II).

The hydrogenation passes through the stage of a semi-acetate. The further splitting of the semi-acetate gives either directly a fatty alcohol (equation Ia), or an ether is formed, which decomposes into one molecule of alcohol and one molecule of hydrocarbon (reaction Ib).

(1). $RCOOCH_2R_1 + H_2 = RCHOHO.CH_2R_1$ Alkyl ester of fatty acid to semi-acetate.

(Ia). $RCHOHOCH_2R_1$ (semi-acetate) $+ H_2 = RCH_2OH$ (fatty alcohol) $+ R_1CH_2OH$ (alcohol).

(Ib). $RCHOHOCH_2R_1 + H_2 = RCH_2OCH_2R_1 + H_2O$. Semi-acetate to ether.

$RCH_2OCH_2R_1$ (ether) $= RCH_2OH$ (fatty alcohol) $+ CH_3R_1$ (hydrocarbon).

(2). $RCOOCH_2R_1$ (alkyl fatty ester) $+ H_2 =$ $RCOOH$ (acid) $+ CH_3R_1$ (hydrocarbon)

These reaction equations are based on the oxygen balance, that is the comparison of quantity of oxygen determined by ultimate analysis in the starting product with that in the compounds resulting from the reactions.

The fatty alcohols, whose synthesis has been described above, represent new starting materials for the recovery of highly valuable wetting, washing and dispersing agents of fatty character. The objection has often been made to the products obtained from alkylated naphthalenesulphonic acid that they do not possess any fatty character at all. The production of soap-like substances from the fatty alcohols consists essentially in the introduction of groups which render them soluble in water. The fatty alcohols have themselves been introduced into the cosmetic industry and the like as salve bases. They are absolutely neutral bodies. The prime advantage possessed by these substances is that there is no production of free fatty acids, when they are used, contrary to what happens when neutral fats are employed, which on becoming rancid form these free acids.

IN the production of soap products and preparations the principal operation consists in the introduction of a sulphonic acid radical into the molecule of the fatty alcohol. This reaction takes place according to the following equation with the aid of sulphuric acid.

$$ROH + OHSO_3H = ROSO_3H + H_2O.$$

The sulphonation of the alcohol may be accomplished with the aid of concentrated, fuming sulphuric acid or chlorosulphonic acid. In order to prevent the reaction from coming to an equilibrium due to the dilution of the acid by the water which is formed therein, the process is carried out in the presence of anhydrous, organic acids or their anhydrides.

According to British Patent No. 317,039, which has been issued to H. Th. Boehme A.G., one hundred kilograms of oleic alcohol are treated with one hundred kilograms of concentrated sulphuric acid, while being cooled to a temperature of zero to 10 C, in the presence of forty kilograms of acetic acid anhydride. French Patent No. 693,-814, which is owned by the I. G. Farbenindustrie A.G., describes a process, wherein the sulphonic acid esters of aliphatic, cycloaliphatic and aliphatic-aromatic compounds are formed. In addition to other examples, the formation of an ester from cetyl alcohol ($C_{16}H_{33}OH$) with chlorosulphonic acid in an ether solution is described. The sulphonates are washed with water containing an electrolyte, treated with aqueous lye to convert them into the sodium salts and then salted out of the aqueous solutions. They are easily obtained in the pure form as powder, tablets, etc.

The salts are produced by a somewhat different process, according to French Patent No. 701,-187 assigned to H. Th. Boehme A.G. The neutralization takes place according to this process in a non-aqueous solution. Thus the sulphonated octadecylic alcohol (from castor oil) is first treated with gaseous ammonia and then with solid soda. When organic bases, such as pyridin, ethylamin, alkylamins and the like, are used according to French Patent Addition No. 37,134, in the place of the usual inorganic alkalies, for the neutralization of the sulphonated products. Then new products of a soap-like nature are formed.

(*Turn to Page* 77)

Shifting Fat Consumption

(*From Page* 23)

	Year	Total net quantity available for consumption	Amount to Soap Kettle	Percent of total available for consumption in soap
		(In Thousands of Pounds)		
Inedible Tallow	1926	395,400	347,951	31
Percent to soap kettle—88	1927	415,510	365,648	31
	1928	409,503	360,363	27
	1929	403,500	355,080	25
	1930	401,698	353,494	26
	1931	468,475	412,258	28
Inedible Greases	1926	106,360	72,325	6
(White, yellow, brown) Per-	1927	102,360	69,431	6
cent to soap kettle—68	1928	136,174	99,398	7
	1929	132,642	90,197	6
	1930	133,395	90,709	6.5
	1931	118,925	80,870	5.5
Palm Oil	1926	138,587	124,728	11
Percent to soap kettle—90	1927	136,534	122,926	10
	1928	188,814	169,933	13
	1929	230,980	207,882	15
	1930	246,249	221,624	16
	1931	262,921	236,629	16
Coconut Oils	1926	521,347	312,808	28
Percent to soap kettle—60	1927	560,783	336,470	28
	1928	625,911	375,547	29
	1929	728,427	437,056	31
	1930	688,388	419,033	30
	1931	628,597	377,158	26
Cottonseed Oil (foots)	1926	1,516,233	181,948	16
Percent to soap kettle—12	1927	1,567,815	188,138	16
	1928	1,502,628	180,315	14
	1929	1,586,054	190,326	14
	1930	1,585,075	190,209	14
	1931	1,322,095	158,651	11
Fish Oils (menhaden & herring)	1926	72,523	36,987	3
Percent to soap kettle—51	1927	97,777	49,866	4
	1928	121,006	61,713	5
	1929	112,901	57,580	4
	1930	73,610	37,541	3
	1931	120,342	61,374	4

NOTE: The percentages indicated as diverted to the consumptive requirements of the soap industry are estimates based on the first census of "Factory Consumption of Animal and Vegetable Fats and Oils" for 1929. The oils and fats for which the figures are given constituted 93.8% of the total requirements of the soap industry in 1929.

The following figures give additional production data compared yearly for various edible and inedible fats and oils:

	Year	Net available for consumption
Bone Grease	1926	20,164,954
	1927	24,652,236
	1928	23,404,383
	1929	24,227,514
	1930	25,435,996
	1931	27,514,033

	Year	Net available for consumption
Tankage Grease	1926	49,733,614
	1927	55,593,714
	1928	57,005,984
	1929	51,653,435
	1930	50,245,776
	1931	47,976,979
Garbage or House Grease	1926	78,515,950
	1927	92,129,623
	1928	96,815,100
	1929	82,198,857
	1930	68,641,829
	1931	74,474,008
Fatty Acids	1926	145,541,433
	1927	168,050,096
	1928	122,748,403
	1929	144,519,163
	1930	140,182,246
	1931	128,546,579
Lard	1926	873,921,935
	1927	925,990,718
	1928	1,016,358,122
	1929	987,957,691
	1930	958,840,903
	1931	1,082,794,181
Lard Compounds (manufactured with animal fats & veg. oil type)	1926	1,122,472,098
	1927	1,160,731,217
	1928	1,129,796,347
	1929	1,208,386,323
	1930	1,207,474,040
	1931	1,148,795,970
Lard, neutral	1926	5,563,338
	1927	27,102,579
	1928	27,623,672
	1929	25,573,900
	1930	16,243,666
	1931	12,637,961
Oleo Oil	1926	59,171,238
	1927	57,885,760
	1928	54,939,469
	1929	59,225,410
	1930	48,385,122
	1931	65,854,460
Corn Oil, crude	1926	115,938,638
	1927	113,124,376
	1928	127,852,374
	1929	155,378,428
	1930	132,527,458
	1931	105,874,066
Linseed Oil	1926	409,190,510
	1927	755,517,328
	1928	785,481,602
	1929	788,505,765
	1930	544,293,123
	1931	479,789,234

Hardening of peanut and linseed oils at low temperatures was obtained when the oils in ether solution were shaken at room temperature with 1.2 to 4.0% nickel on kieselguhr at 145 to 400 atmospheres pressure for 24 to 48 hours. In all cases tried, hardening occurred, ranging from the consistency of soft tallow up to hard brittle fats. The increased pressure shortens time only, while the low temperature effects a selective saturation of the double bonds. Selectivity of this kind has heretofore been secured in the factory at high temperature, around 180 deg., by means of a partial killing of the catalyst sufficiently to saturate easily the 9, 10 double bond of the linolic acid without saturating the other, hence forming isooleic acid.—*Chem. Umshau Fette, Oele, Wachse Harze,* 38, 289, 1931.

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A method for recovering oil from spent fullers earth which has been used for bleaching calls for the agitating of the earth with an equal quantity of a hot aqueous solution containing about 2% caustic soda and about 10% ordinary salt. Several volumes of hot water are added to wash out the oil and the mixture is allowed to stand until the oil collects on the surface and is then withdrawn.—U. S. Patent No. 1,828,035.

—o—

To prevent the development of rancidity in vegetable oils, in such an oil as castor which contains an unsaturated glyceride, the oil is treated with paracetic acid or a peracetate in the proportion of about five per cent of the weight of the oil.—U. S. Patent No. 1,828,708.

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Stocks of crude cottonseed oil on hand in United States as of February 29, 1932, totaled 130,375,236 pounds, as against 104,746,584 pounds on the same date in 1931. Stocks of refined oil were 632,618,450 pounds on February 29, 1932, as compared with 495,136,493 pounds February 29, 1931.

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A decrease in the duty on activated clays from the present rate of ¼c. pound and 30% ad valorem is requested by L. A. Salomon & Bro., New York, in an application filed with the U. S. Tariff Commission. The application asks for an investigation of costs of production.

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Foster D. Snell, Inc., consulting chemist, Brooklyn, has recently established a deport service to manufacturers of chemical specialties. For a fixed monthly fee subscribers receive each month analyses of five chemical specialties purchased on the open market.

A. E. Staley, Jr., has been elected president of A. E. Staley Manufacturing Co., Decatur, Ill., producers of corn oil. He succeeds his father, A. E. Staley, who becomes chairman of the board.

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Shellabarger Grain Products Co., Decatur, Ill., manufacturers of soybean products announce that Clarence S. Bowers, formerly with A. E. Staley Manufacturing Co., will take complete charge of their sales activities. The capacity of the plant has been increased twice within the past six months.

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Exports of powdered and flaked soaps from United States during January, 1932, equalled 151,720 lbs., worth $10,892, as against 107,948 lbs., worth $11,074, in January, 1931.

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Higher Fatty Alcohol Derivatives

(*From Page* 73)

THE solutions of the alcoholic sulphonates are stable to acids and what is particularly important, to lime and magnesia salts, since these salts of the fatty alcoholic sulphonates are sufficiently soluble in water. The aqueous solutions of the alkyl esters react neutral, which is particularly important in use of these products for the scouring of wool. There is a strong analogy between the properties of soaps and the fatty alcoholic sulphonates. The differences are often only qualitative, and the derivatives of the fatty acids are found to possess more advantageous properties when this comparison is carried further.

According to Schrauth (*Chemische Zentralblatt,* 1931, I, 1984), the sodium salts of the alkylsulphonic esters are superior to ordinary soaps in emulsifying and dirt dissolving properties. There has been no class of substances up to the present time which gave the washing results obtained with the new products, whereby the washed goods attained a satisfactory soft handle. The properties of the individual members of the alkylsulphonic acid esters vary considerably in accordance with the length of the carbon chain. The sodium salts of the members C_8 to C_{14} are easily soluble in cold water and are only difficultly salted out by electrolytes. They possess striking wetting and emulsifying properties. The higher sulphonates C_{16} to C_{18} have a lesser wetting power, but they give the wash a very excellent soft handle. They are soluble only in hot water and are easily salted out of solution.

These properties are the reason why coconut oil is selected for hydrogenation and sulphonation according to the processes, which have been described above, since this oil consists principally of the glycerides of lauric acid (C_{12}) and of myristic acid (C_{14}).

THERE is a second tendency to be noted from the publications on this subject and that is to obtain these soap preparations in such a form that they contain alkylsulphonic acids in addition to the sulphonic acid esters, or alkylsulphonic acids alone. An effort has been made to substitute carbon directly. It has become known from the work done on highly sulphonated oils as for example on alkylnaphthalenesulphonic acids, that the calcium salts of the true sulphonic acids, $(R.CH_2SO_2O)_2Ca$, possess particularly good solubility in water, which is superior to the solubility of the calcium salts of alkylsulphonic esters, $Ca(R.CH_2OSO_2O)_2$. An additional valuable property of the sulphonic acids is their high resistance to the action of acids, which make possible their use in the carbonization of wool.

The sulphonation of alcohols, which are obtained by the high pressure hydrogenation of coconut oil and palm oil, are described in British Patent No. 351,452, assigned to H. Th. Boehme A.G. In addition to sulphonic acid esters, true sulphonic acids are also formed by the conversion of the alcoholic mixture with chlorosulphonic acid at an elevated temperature of 30 degrees C.

Schrauth has obtained complete conversion to the true sulphonic acids according to the following reaction equation in which alkylsulphonic acid esters are treated with sodium sulphite.

$$RCH_2OSO_2ONa + Na_2SO_3 = RCH_2SO_2ONa + Na_2SO_4$$

The sodium salts, which are obtained in this manner, are outstanding soap preparations.

New compounds are obtained, when an attempt is made to cause the molecule of the aliphatic alcohol to become soluble in water by condensation with basic groups. These compounds are formed by the combination of amines of the composition, RNH_2 or R_1NHR_2, with the aliphatic alcohols, and form higher alkylamines, whose salts are easily soluble in water.

French Patent No. 696,328 is concerned with a process for the preparation of cleansing agents which consist of salts of alkylamines. They are obtained for example by the condensation of diethylamine with octyl bromide.

$$C_8H_{17}Br + (C_2H_5)_2NH = C_8H_{17}.N.(C_2H_5)_2$$

Similar bases are obtained from cetyl bromide ($C_{16}H_{33}Br$) and octadecyl bromide ($C_{18}H_{37}Br$). The amines can be easily converted into their soluble salts with the aid of mineral acids. The conversion of amines of similar constitution into sulphonic acid salts is described in British Patent No. 353,232. The sulphonating agent is chlorosulphonic acid.

INSECTICIDE AND DISINFECTANT SECTION

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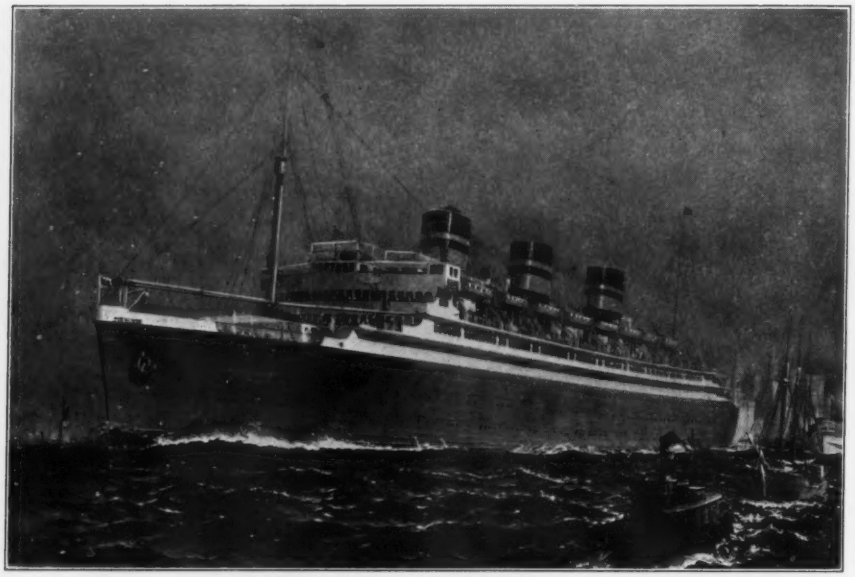

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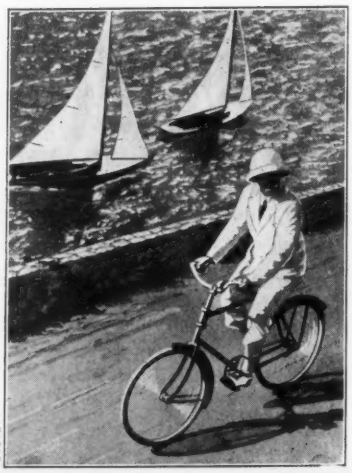

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INSECTICIDE AND DISINFECTANT SECTION

A Department of SOAP

SOAP is official publication of *The Insecticide and Disinfectant Manufacturers Association.*
Harry W. Cole, Holbrook. Mass., Secretary.

The Mid-Year Meeting, May 23-24!

THE Eighteenth Annual Mid-Year Meeting of the Insecticide & Disinfectant Manufacturers Association will be held at the Edgewater Beach Hotel, Chicago, on Monday and Tuesday, May 23 and 24. This is just about a month away. That matters of unusual moment will come before the Chicago meeting this year, need not be repeated. Those in the insecticide and disinfectant industries know only too well what the problems are which will have to come up for discussion,—that are crowding to the front this year more than ever before. May 23 and 24. Make your plans now to arrive in Chicago on Sunday morning, May 22!

—o—

The Insecticide Standard

THE official method of the Insecticide & Disinfectant Manufacturers Association for testing household liquid spray insecticides is published in full in this issue. There are given also the specifications for a petroleum oil which has been designated as the medium for testing the relative resistance of one strain of flies as compared with another. It is pointed out here that this oil has not been recommended by the Association or its Insecticide Committee as a base for liquid insecticides, but that it has been officially designated as a *standard test oil.* The Insecticide Committee has requested that this point be made perfectly clear.

As has been pointed out before, the new standard for liquid spray insecticides, and the method of testing, are not perfect by any means. They do, however, represent something definite and tangible as a starting point from which the practical value of liquid insecticides may be judged. Undoubtedly, now that the standard and a test method have been adopted, they will both be the subject of widespread discussion which is almost certain to result in changes and modifications. Such modifications should come from experience with the practical use of the standard and the test in commercial work.

It is obvious that the new standard for liquid insecticides is open to misconception by the public and by uninformed buyers generally. With this in mind, it should be remembered that the standard is based on results obtained with especially resistant insects under unusually rigid conditions in the laboratory. An insecticide which meets the standard under these test conditions, should give excellent results in practical industrial or household application. We suggest that any wide dissemination of the standard and test method among consumers in the form of reprints or booklets should await further careful study and the definite adoption of any revisions which may be agreed upon.

Notes of the Trade

Leeno Products, Inc., occupied its new plant at 141 Landwehr Lane, Baltimore, Md., April 1.

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Cello-Wax Co., Baltimore, maker of a liquid cleaner, recently increased the capacity of its plant to take care of growing demand.

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"A Résumé of Recent Work on Antiseptics and Disinfectants" is the title of a paper to be delivered by Dr. George F. Reddish, Lambert Pharmacal Co., at the midwest regional meeting of the American Chemical Society to be held at the Hotel Coronado, St. Louis, May 5-7.

—o—

S. B. Penick, S. B. Penick & Co., New York, has been elected vice-president of the Drug & Chemical Club for the coming year. Other officers are Joseph Huisking, Charles L. Huisking & Co., secretary; A. A. Wasserscheid, treasurer; and as members of the board of governors, Charles J. A. Fitzsimmons, Orbis Products Trading Co.; Francis J. McDonough, New York Quinine & Chemical Works, and Albert A. Teeter, Charles Pfizer & Co.

—o—

"Chemically Combating Insect Pests of Foodstuffs" is the title of an address given by Dr. R. C. Roark, Insecticide division, U. S. Department of Agriculture, at the New Orleans meeting of the agricultural division of the American Chemical Society, March 28 to April 1. Dr. Roark reviewed the whole field of insect control by means of insecticides, with special reference to the health hazards of arsenical, lead, HCN, and other residues left in or on treated foodstuffs, and the recent development of new fumigants and contact and stomach insecticides that are relatively non-poisonous to man.

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It is reported by Consul General Wesley Frost, Montreal, Canada, that the demand for pyrethrum extracts, and the liquid insecticides made therefrom, is negligible. A leading insecticide manufacturer stated that his firm disposes yearly about 1,000 gallons of liquid insecticide and fly sprays. The large majority of manufacturers do not handle liquid insecticides. The demand for insect powder, however, is heavy, and practically all insecticide manufacturers and wholesale druggists in Montreal carry pyrethrum insect powders to the exclusion of the liquid pyrethrum insecticide or fly spray.

Testing Liquid Insecticides

Official Peet-Grady Method of Insecticide & Disinfectant Manufacturers Assn. with Minimum Standard and Oil Specifications

THE minimum standard for general liquid household spray insecticides, and the official Peet-Grady Method for testing such insecticides, as adopted by the Insecticide & Disinfectant Manufacturers Association, is published herewith in detail at the request of the Board of Governors of the Association. Specifications for the Pennsylvania oil designated for testing the comparative resistance of house flies bred in one laboratory as compared with those bred in another, are also given. Any additions or revisions in the minimum standard or in the method of testing will be announced promptly if and when they may be made.

The exact wording of the minimum insecticide standard as adopted by the Association and issued for publication by the Board of Governors, is as follows: "The members of the Insecticide & Disinfectant Manufacturers Association agree that a minimum standard for a general household liquid spray insecticide should be 95% down ten minutes after spraying, and at least 60% kill, twenty-four hours after spraying, as determined by the Peet-Grady Method on house flies. In addition, the liquid base should exceed 120 deg. F. in flashpoint as determined by the Tagliabue open cup method, and should not be referred to as kerosene, kerosene petroleum, or petroleum insecticide base in the future, but as a hydrocarbon distillate base. These tests shall be conducted at a temperature of 85 deg. F. and 60 to 70% relative humidity. To compare the resistance of flies used in one laboratory to those used

THE STANDARD

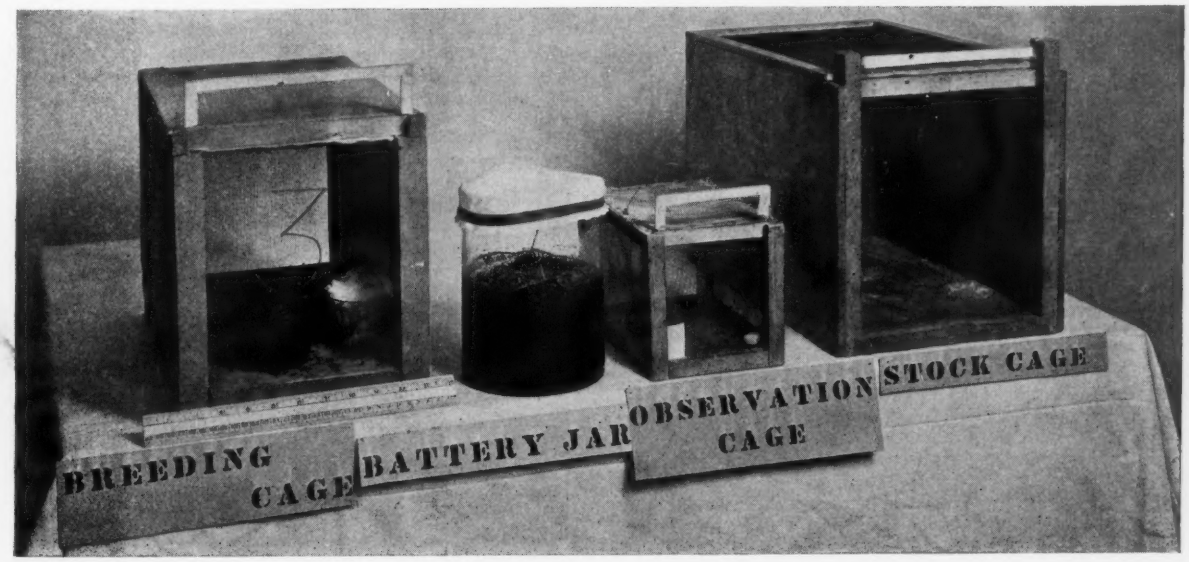
The official minimum standard of the Insecticide & Disinfectant Manufacturers Association for general household liquid spray insecticides, as recommended by the Insecticide Committee and adopted by the Association, is as follows:

By Peet-Grady Method on house flies—

Down in ten minutes.....95 %
Dead in 24 hours.....60 %

Age of test flies.....5 days
Temperature of chamber.....85 F.
Relative Humidity of chamber 60-70 %

Flashpoint.....Not less than 120 F.
(Tagliabue Open Cup)



The required fly-breeding equipment for the Peet-Grady method

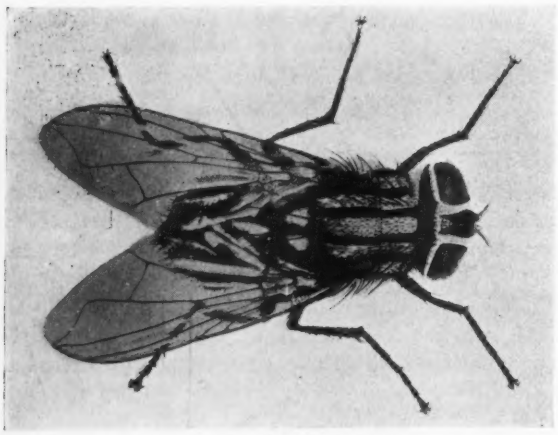
in another laboratory, this method will be followed out using ordinary kerosene as originating in the Pennsylvania field. Per cent knock-down and per cent kill by this oil will be set forth in the complete specification. The flies used in this test shall be five days old."

THE PEET-GRADY METHOD

A Biological Method for the Determination of the Effectiveness of Household Insecticides

This paper is a revision of the original papers from the Research Laboratories of the Röhm and Haas Co., Inc. by C. H. Peet and A. G. Grady, ("Journal of Economic Entomology," *vol.* 21, *pgs.* 598-625, *August,* 1928) *prepared under the supervision of the Insecticide Standardization Committee as a part of the standardization program of the Insecticide & Disinfectant Manufacturers Association.*

THIS paper details a successful method evolved whereby large numbers of house flies can be reared through the whole year. The technic employed is simple, inexpensive and dependable. Full credit for the continuous breeding of this insect should be given to Glaser[1] who conceived the idea of supplementing the larval medium with yeast cells suspended in water during the winter months.



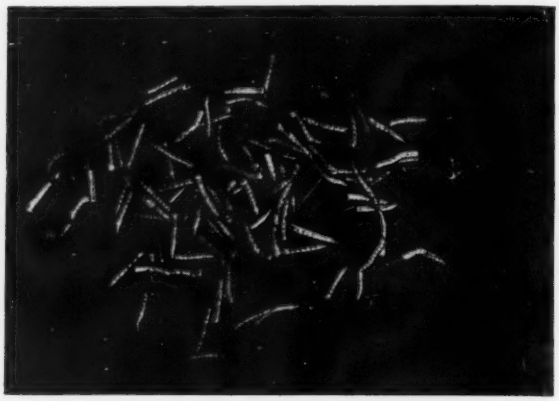
The common house fly, *Musca domestica*

The literature on the biology of *Musca domestica* has assumed extensive proportions and it is not the intention of the writers to deal with it except to note some observations on the activity and longevity of the imagines during the winter months.

The larvae were reared throughout the winter on a medium consisting of fresh horse manure which was kept in a moist condition with water and yeast cells suspended in water, according to Glaser's method. Excellent results were obtained. Attempts were made during the latter half of January and during the month of February to rear flies on horse manure alone. In every case, except two, the insects died either in the larval or pupal stages. In the two successful attempts the horse manure was taken from the stables during a warm spell. Whether this had anything to do with carrying the larvae through to the adult stage was not determined.

From these experiences and the experiences of other investigators it was concluded that unless the horse manure was supplemented during the winter months larval life could not be supported and a continuous supply of insects could not be maintained.

[1] Note on the continuous Breeding of Musca domestica, Journ. Econ. Ent., 1927, XX, 432-433.



The larval stage, the maggots of the house fly. They live in loosely packed horse manure for laboratory rearing

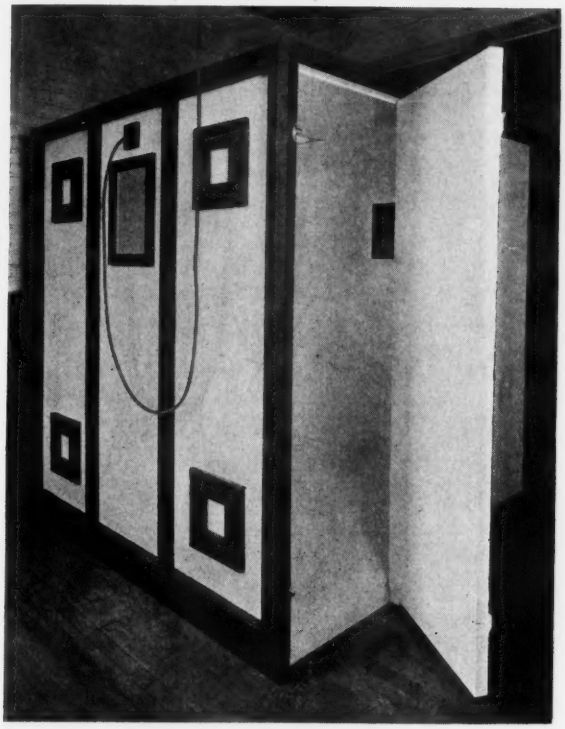
The adult insects thrived exceedingly well on a diet consisting of milk, lump sugar, sweetened bread and yeast suspended in water. About 10 cc. of milk was dropped into the cages every day and about the same amount of yeast suspension was fed every second day. Fresh sweetened bread was placed in the cages about once a week. The bread was kept in an assimilable condition by wetting it with water. Other foods were added to this diet at different times such as beef extract, casein and fish-scrap. However, the adults developed sufficiently well on milk, bread, sugar and yeast so that the strictly protein foods were not used as regular parts of the diet.

The apparatus and equipment used to rear the house flies throughout the winter months were as follows: A constant temperature insectary where the breeding cages, rearing jars and stock cages were kept; breeding cages in which the insects were bred and oviposition took place; rearing jars in which the insect was reared from the egg to the adult stage; and finally, stock cages where the flies to be used for insecticidal tests were kept.

Insectary

A ROOM 12 feet long, 11 feet wide and 9 feet high was thoroughly insulated with "balsam wool." One end and one side wall contained double windows which were lightly sprayed with whitewash. The entrance door was in one corner. Shelves lined three of the walls and a rack of shelves was built in the center of the room. The heating element consisted of four 1 inch steam pipes totaling 72 feet in length running along the inside of the two outside walls of the chamber. A Sarco heat regulator was used to control the temperature of the heating unit.

The eggs of the house fly magnified many times



Exterior view of the standard Peet-Grady Chamber, which is a six foot cube

Electricity may be substituted for steam in heating the room if it is considered more desirable. Excellent temperature control can be obtained by using a unit similar to that manufactured by the General Electric Co., Catalogue No. 2829653 G-3, CR 7002, 110 volt.

A cooling unit consisting of an Aerofin radiator containing 300 feet of ¾ inch, finned radiation was suspended in the center of the room from the ceiling and connected to a cold water supply (this water was about 50 to 55° F. summer and winter). A Sylphon thermostatic valve controlled the flow of water through the cooling unit and a drip pan suspended beneath the cooling unit caught the condensate which collected on the cooling coils and delivered it by a drain to a sewer line. The temperature regulators were set at 85° F. and a Brown Recording Thermometer showed that the system thus installed was capable of holding the temperature of the insectary to 85° F. ±1°.

The humidifier described in the original paper was later eliminated since it was found that the moisture of the culture medium in the rearing jars kept the humidity of the chamber at about 70%. Strict control could not be obtained without recourse to very elaborate equipment.

Breeding Cages

BECAUSE flies are susceptible to nutritional deficiency diseases and to attacks of parasites and parasitic fungi it was found best to keep the insects used for breeding purposes in relatively small separate cages so that if one colony of breeders became infected the disease could be checked before it spread to the other cages. As a result of this precaution, no high mortality occurred among the flies in the breeding cages that could be laid to a diseased condition.

As it was desired to have on hand hundreds of flies of known ages at all times, six breeding cages were used. Their dimensions were: length, 18 inches; breadth, 9 inches; height, 10 inches. The floor was made of a board ½ inch thick to which the frame was attached. The frame was constructed of ½ inch strips. The upright strips were nailed to the floor of the cage and connected by ½ inch crosspieces. The sides, top and back were made of wire fly screening, (1/16 inch mesh) tacked to the frame. The front was a piece of glass set in grooves which served as a door. These cages are easy to clean, provide plenty of room for the insects to move about and access to the inside is gained easily by pushing up the glass door to introduce food and insects.

Rearing Jars

ORDINARY battery jars 6 inches in diameter by eight inches high were used for rearing the larvae. These jars were closed by pieces of cheesecloth about 9 inches in diameter which were held in place by ¾ inch elastic "garters." This type of top is inexpensive, easily made, gives entirely adequate ventilation, and will serve for a number of generations of flies.

Stock Cages

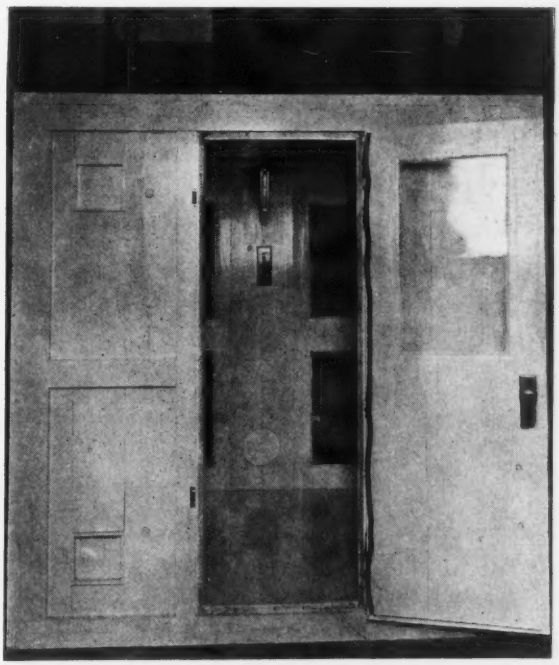
VARIOUS efforts were made to develop cages which would allow automatic or semi-automatic transfer of flies from the rearing jars but none proved very successful and ultimately the same type of cage was adopted as were used for breeding cages. These cages were numbered in order that the age of the flies contained therein might be recorded.

Since flies were not used for insecticide tests after they were 5 days old, only five cages were necessary for a series but when large numbers of flies are being bred, it becomes necessary to have duplicate series of cages in order that overcrowding of the cages may be avoided.

Transfer of the flies from rearing jars to stock cages is accomplished by lifting the glass slide of the cage, inserting the covered end of the rearing jar, slipping off the cheesecloth cover, tapping the jar, withdrawing the jar, closing the glass slide and replacing the cheesecloth cover.

Procedure

IN each of the breeding cages about two hundred adult flies, about equally divided as to sex, were kept. When the insects died or became unduly soiled or injured they



View of the interior of the Peet-Grady Chamber, showing temperature and humidity control, and large pipe at top for rapid exhausting following each test

were replaced by others. Two 200 cc. beakers filled with wet horse manure were placed in each cage for the flies to oviposit on. In the course of two days hundreds of eggs were deposited on the medium. Every day the beakers containing eggs and larvae were removed. Other beakers filled with fresh horse manure, to which about 15 cc. of water had been added, were then placed in the breeding cages. In this way fresh medium was kept in the breeding cages continually for the flies to oviposit on. It appears that this part of the technic stimulated the responses of the females in regard to oviposition and aided somewhat in keeping the flies from laying eggs on the adult food, i.e., the sweetened bread.

To insure a large supply of adults, several cultures were started each day. About five or six hundred eggs and larvae, obtained as above, were transferred to each of the rearing jars. Each jar was filled to about the three-fourths mark with fresh, loosely packed horse manure. It was found that if about 200 cc. of water was added to the manure when the culture was started it was sufficient to keep the medium in a moist condition until the adults emerged. The losses resulting from larvae drowning were insignificant. To this 75 cc. of the supplementary food, yeast cells suspended in water, was added and about 10 cc. more was dropped in the jars every other day until the larvae were about ready to pupate. The amount of yeast to be fed varies, of course, with the number of larvae to be reared. It was found that in this case if the amount of yeast suspension was cut down the adults, if they emerged, were apt to be stunted and possess little vitality.

In making up the yeast suspension Glaser advises, "In practice we dissolve a one pound bakery cake of commercial yeast in two liters of water. The suspension of yeast cells is then distributed in pint bottles and autoclaved, to kill fungi which often cause trouble, and stored on ice." We have found that if one pound of yeast is dissolved in two and one half or three liters of water, very good results can be obtained. At first the yeast suspension was autoclaved using pint milk bottles as receptacles. A pyrex flask was later substituted for the milk bottles as these are apt to crack when subjected to high temperatures a few times. A number of cultures were reared using yeast suspension which was not autoclaved. While this part of the technic may be left out, with little or no difference in the results, it is advisable to sterilize the yeast suspension if an autoclave is available.

The horse manure containing eggs and larvae was then emptied onto the fresh medium, the covers fitted on the jars and the culture was incubated at 85° F. The larval medium settled in a few days to about the middle of the jar which gave the adults plenty of room to move about when they emerged.

Appearance of the floor of the Peet-Grady Chamber ten minutes after spraying. These flies are carefully taken up and kept in an observation cage for 24 hours

THE OIL SPECIFICATION

The Pennsylvania oil, adopted as standard by the Insecticide & Disinfectant Manufacturers Association for testing the relative resistance of flies bred in one laboratory as compared with those bred in another, shall have the specifications as listed below:*

A. P. I. Gravity	49-50
Flash Point	Above 120 F.
Initial Boiling Point	Above 350 F.
End Point	Not Above 530 F.
Saybolt Color	30 Plus
Odor	Slight
Iodine Number, Hanus	Below 1

Such an oil when used without additions by the Peet-Grady Method against house flies should not give more than 20 % down and 6 % kill. House flies showing these average results shall be considered to have standard resistance to the action of liquid spray insecticides.

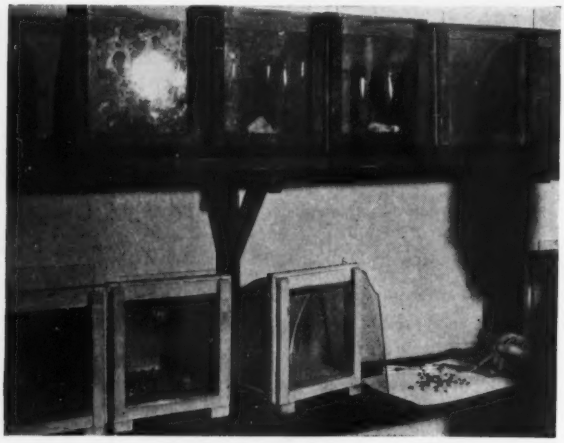
* An oil meeting these specifications, and designated for standard comparative test purposes by the Insecticide Committee of the Association, is available commercially under the name of Deosene from L. Sonneborn Sons, Inc., 88 Lexington Ave., New York.

At this temperature the time required from egg to adult was approximately eleven days. Some of the adults emerged nine days after being placed in the rearing jars and the rest within eleven days. As the flies emerged they were transferred from the rearing jars as previously described and either placed in a stock cage to be held for insecticidal tests or used for breeding purposes. It is advisable to take the flies out of the rearing jars soon after they emerge so as to avoid overcrowding. When large numbers of adults are allowed to stay in the rearing jars they are apt to become excited and mill about the top of the jars in an effort to escape. This often results in a high mortality.

To draw any conclusions from insecticidal tests which would shed light on the toxicity of a compound, the age and the condition of the insects used should be known. This appears to be particularly true of flies. We have found that the adult house fly bred under artificial conditions during the winter months is most active and resistant when it is four or five days old. In comparing results of insecticidal tests run during the summer with wild flies and those reared artificially it developed that winter flies, four or five days old, were more uniformly resistant to toxic compounds than wild summer flies and fully as resistant as controlled cultures developed during the summer. *As the age of the flies was of great importance they were kept in separate cages dependent on the date they emerged.*

After the fifth day flies which had not been used for insecticidal tests or transferred to the breeding cages were killed. The cage was then thoroughly washed with soap and water and dried. As the adults were continually emerging in the rearing jars it was necessary to use the cage immediately for a new supply. In this way a continuous cycle was maintained with a minimum number of cages.

When flies were needed for insecticidal tests, the stock cage was taken to the testing chamber, the slide was raised slightly until the desired number of insects had



Twenty-four hours after the test, the "deads" in the observation cage are counted. They should show a minimum of 60%

escaped into the chamber, the slide was then lowered and the door of the chamber was closed.

Observations

A FEW observations on the activity and longevity of the adults during the winter months were made. It was found that the adult fly was very active and resistant until about the eighth day after it emerged, reaching what might be called its peak of activity and resistance about the fifth day. The longevity of the adult varied from two to thirty-three days with an arithmetical mean of thirteen plus days. It was also noted that the ovaries and testes developed rapidly and in some cases eggs were deposited by the flies in a little over three days after the time of emergence. Some investigators[2] have reported that the life of the adult house fly, reared during the warmer seasons, averages approximately twenty days and that the time required for the development of the ovaries and testes was longer by several days than observed in this case. Whether this comparatively short life cycle and rapid development was due to the fact that the flies were continually subjected to a constant temperature of 85° F., a special diet, absence of direct sunlight, or to other factors was not determined.

General Testing Considerations

ALTHOUGH a vast amount of work has been done on examining various compounds to determine their value as insecticides, the variations in the methods of testing these compounds and in the standards set up by the various investigators have made it almost impossible to draw valid comparisons between the results reported. In some cases insects have been tested by exposing them to the fumes of the particular compound being tested even though the compounds were relatively non-volatile and had to be heated in order to volatilize them. In others the compound being studied was dissolved in some oil carrier and dispersed by spraying. Still other determinations of insecticidal effectiveness have been made by completely immersing the insect to be tested in the material under consideration either at 100% concentration or at various dilutions. Obviously there is almost no common ground between these methods of testing. The desirability, however, of formulating some uniform testing procedure is evident and it is hoped that this paper will serve to stimulate other investigators to work upon this problem and to offer such alterations and improvements in technique as may seem desirable.

The most common pest the world over is the fly and the economic significance of the various species of stable flies is so well appreciated that a large program of research upon its control is being undertaken by the government. The annoyances caused by the house fly as well as the danger of infection due to its presence are pointed out in the advertisements of every magazine. The smaller and generally less prevalent fruit flies, gnats, etc., constitute a special problem in certain localities. Accordingly this paper deals specifically with methods of determining the effectiveness of compounds against flies. There is, of course, a great variation in the resistance of the different families of flies to the action of insecticides, but the relative resistance of these various families follows approximately the same curve against all insecticidal compounds. Accordingly, once that curve has been established for all the families, which are sufficiently common to constitute pests, it is only necessary, in testing a new compound, to test it against one or two families in order to locate the curve of its efficiency. This paper makes no attempt to establish these curves but serves solely to point out a method of testing which is applicable to all families of flies.

The determination of toxicity against insects must be a purely biological test and, like all biological tests, it is subject to the very considerable variability which accompanies the reaction of the living organism to external effects and influences. This variability is innate in all creatures and cannot be controlled but the superficial variables which have heretofore been ignored, or too little considered, can be so accurately controlled that only the biological variable remains to remove such tests from strict reproducibility and the average will be just as certain as life insurance mortality tables.

The variables which this investigation has shown to possess the greatest significance are: time, temperature, humidity, insecticide concentration, carrier, fineness of spray, air conditions, angle of spray and condition of insect.

It is obvious that it is unfair to draw a comparison between two insecticidal compounds one of which is allowed to work upon the insect for twice as long a time as the other.

The importance of temperature control may easily be demonstrated by exposing two groups of insects from the same brood to the same insecticide at say 60° F. and 85° F. The higher percentage kill among the insects in the warmer chamber will be quickly appreciated.

The influence of humidity on the resistance of the insect to toxic compounds has been generally ignored in testing for insecticidal power. It does not have as great an effect as the temperature differential but it should be considered.

The fact that a higher concentration of material being tested in any given solution should produce a greater or more rapid kill does not require discussion.

The variations in effectiveness produced by variations in spray concentration are less easily demonstrable but undoubtedly just as certain for if the spray or vapor of any material under consideration be more attenuated in one instance than in another, there must be a higher concentration of insecticide in the area which has the greatest spray concentration.

Few carriers are inert but many studies have shown that there is a very considerable difference between the toxicity of these numerous relatively inert solvents.[1] *Accordingly, if one investigator reports on an insecticide using as a carrier a certain fraction of Pennsylvania Oil, another on the same material using a corresponding fraction of California Oil, there will be a disagreement. Sim-*

[2] Howard, House Flies, U. S. Dept. Agri. Farmers Bulletin, 679, 9115; Glaser, Rearing Flies for Exp. Purposes with Biological Notes, J. Econ. Ent., 1924, XVII, 486-496.

[1] Moore & Graham. A study of the Toxicity of Kerosene, Jour. Econ. Ent., 1918, XI, 70-75.

(*Turn to Page* 121)

The Rat and Its Extermination

History, Habits, and How to Fight It

By J. A. ROBINSON

President, Pastoxine Distributors of America

FOR centuries, man has been fighting the rat, but with little progress. In the battle of human wits against the highly developed instincts of the rat, the rodent has apparently emerged victorious. Armed by nature with the most resourceful qualities and equipment for its destructive work, — strong, cunning and ferocious, with delicate and dexterous paws, teeth like blades of tempered steel, remarkable powers of endurance and persistence, backed up with extreme fecundity, the rat has been able to withstand the onslaught of man's superior intelligence, and has become a foe worthy of his serious recognition. Originally, a native of southern Asia, the rat has accompanied man to all parts of the world traveling as he has traveled in ox teams and the backs of donkeys, by steamship and railway. Down through the ages, history traces the unceasing activities of these arch enemies of mankind, and their descent from glorification and deification to their present lowly status.

Since Heaven's ukase first ordained the rat to live and thrive
Their long descent they proudly trace from forbears once alive,
Who reigned in honor through the land, in thirty counties wide,
With mandate to collect their food from off the countryside:
To take their toll of the five chief grains; rice, millet, wheat, hemp, bean:
To raise the rodent tribe in peace, with all their kith and kin—
Each with his name, each in his place, as plainly here is seen.

Rats and mice no law respect; they break with unconcern;
Rattle the tea cups on the shelf and winepots overturn:
The candles lit before the God—his incense too they gnaw:
They make a playroom of the bed, a parade ground of the floor:
Then run along the footboard with a noise like hurtling spears,
Jump down upon the lampstand, which in its fall the curtain tears,
Bang! Bang! They scuttle home at last just ere the dawn appears.

— From an old Chinese Legend

Man's hatred of the rat is instinctive. The harsh and lifeless fur, the dull and hateful expression of the eyes, the long, scaly, worm-like tail, do not inspire the trust and affection so prevalent with other domesticated animals. Further, through the fleas that infest them, rats are almost wholly responsible for the transmission of bubonic plague, and it has been proved also that rats are active agents in spreading pneumonic plague and possibly other epidemic diseases.

There are five families of rodents—(a) rabbits, hares; (b) porcupines; (c) squirrels; (d) mice, meadow mice, hamsters, (e) rats and mice. It is with the latter group, known scientifically as the genus *mus*, that the civilized world is chiefly concerned. In Sanscrit, *"mus"* or *"mush,"* is derived from a word meaning "to steal." History is replete with interesting anecdotes evidencing that our ancient forebears were confronted with rodent problems similar to those of today.

The Nubian cat, as a destroyer of rats and mice, was deified before the Third Dynasty (2800 B.C.). The sacred cat Bubastis was not only the patron goddess of the prosperous delta city of Bast, but also the goddess of love and feminine fashion. In the holy city of Bast stood the famous cat mausoleum, where the remains of sacred felines were ceremoniously laid to rest in bronze or wooden cat shaped coffins. Each year, lower Egypt thronged to the riotous feast of Bubastis, and families went through a mourning ritual for deceased cats similar to that for human members of the household. Since the cat embodied all godly virtue, the rat probably came to symbolize evil by contrast. Rats and mice were probably responsible for the cat's deification because the Nile delta has been a grain growing region since prehistoric times and was undoubt-

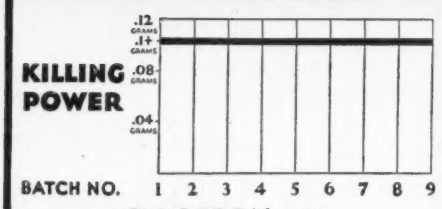
1/3 of all Pyrethrum Flower Imports

in 1931 were used in making

PYROCIDE No. 20

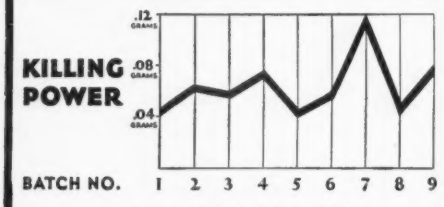
The *Only Standardized* Concentrated Pyrethrum Extract

KILLING POWER
of Pyrocide No. 20 compared with unstandardized Pyrethrum extracts



PYROCIDE No. 20

When you use Pyrocide No. 20 as the base for your fly spray or household insecticide, using one part Pyrocide in 20 parts light mineral oil, the pyrethrin content is stabilized at .1+ grams per 100 cc.—every batch the same—because the pyrethrin content of Pyrocide No. 20 is standardized.



NOT STANDARDIZED
(Pyrethrin Content Fluctuates)

When you use pyrethrum concentrate made by direct extraction (and not standardized) the pyrethrin content of each batch of fly spray or household insecticide will vary, as widely as from .04 grams to .12 grams per 100 cc.

JUST three years ago, Pyrocide No. 20 was first introduced on the market, and today the makers of Pyrocide No. 20 are using ⅓ of all the Pyrethrum flowers imported into this country. This statement is based on official United States Government reports showing the imports into this country in 1931.

What does this prove? It proves that the insecticide industry prefers a *standardized* pyrethrum extract. Therefore, the industry has turned to Pyrocide No. 20 which is the only *standardized* concentrated extract with a guaranteed, absolutely stabilized pyrethrin content. Because of this, you can guarantee the toxic strength of your finished product.

There is another reason why the industry has turned to Pyrocide No. 20. Due to our new laboratories established in Japan, we can buy flowers of a higher pyrethrin content at the same price that other manufacturers are forced to pay for inferior flowers.

Pyrocide No. 20 is manufactured in our own plant. No oleoresin is purchased from other manufacturers. We believe that the only way to produce a reliable product is by placing the raw material sources and the manufacturing process under unified laboratory control.

We have no secrets in connection with our processes or production methods. Anyone is welcome to visit our plant at any time for inspection. Pyrocide No. 20 contains nothing more toxic to humans than pyrethrum, nor does it contain any other active principle, the efficiency of which is as yet unproved in the control of flies.

Warehouse stocks are carried at New York, Los Angeles, Minneapolis and many foreign points. For your own percolation, we can also supply you with Pyrethrum flowers with known pyrethrin content in whole, ground and powdered form.

McLAUGHLIN GORMLEY KING COMPANY
1715 Fifth Street SE., Minneapolis • *Pyrethrum Specialists Since 1901*

PYROCIDE No. 20
STANDARDIZED EXTRACT OF PYRETHRUM FLOWERS

Say you saw it in SOAP!

edly overrun with these rodents before the advent of the cat from Nubia.

During the latter part of the second millennium before Christ, Cretan Teneri invaders landed upon the shore of Asia Minor for the purpose of colonization. For a long time they were restricted to the Coast by the aboriginal Pontians, with whom they continually fought. A decisive victory for the Cretans was credited to field mice, which their Apollo caused to gnaw the leather straps from the shields of the enemy. Moses received his cultural training in Egypt and with it the traditional hatred for mice. In the Book of Leviticus, among the commandments to Hebrews, he admonishes his followers,—"These also shall be an abomination to you among the creeping things that creep upon the earth; the weasel, and the mouse and the tortoise after his kind.—These are unclean to you among all that creep: whosoever doth touch them, when they be dead shall be unclean until even."

Ancient philosophers attempting to trace the origin of mice, were for a long time, under the impression that life was generated spontaneously. Aristotle (30 B.C.) said that mice were generated spontaneously from filth in houses and in ships. A Talmudic fable speaks of the mouse in the process of creation, the foreparts already flesh and the hinder parts still earth. The clergy of the Middle Ages never ceased to comment upon the voluptuous and libidinous habits of mice. Curious churchmen raised mice in order to observe their lustful and wicked actions.

Before the advent of the Persian cat into Northern Europe, during the time of Charlemagne, rats and mice frequently multiplied in such numbers that they could not be kept in check by the weasels maintained by the more fortunate families. These conditions gave rise to such stories as that of the Pied Piper of Hamlin. While this tale is mythical, actually, rats are excellent swimmers and rarely die by drowning.

While it is now recognized that the rat not only ravages crops and property, but is the deadliest scavenger of human life, apparently extenuating circumstances for its existence were discovered during the Middle Ages. Gastronomic epicureans considered rats and mice delicate tid-bits of food. A leading Medical Journal, the London Pharmacopœia of 1667, instructs its readers as follows: "A flead mouse dried and beaten to powder and given at a time helps such as cannot hold their water or have diabetes." In Europe, mice used to be eaten as a remedy for toothache. New born mice dissolved in olive oil are a popular panacea for human ills in Turkey and Greece, even today.

Rats and Their Habits

A FULL appreciation of mankind's greatest enemy in the animal world may only be had by familiarity with rats and mice and their habits, and the astounding economic loss due to their activities. It is estimated that this country has probably as many rats as people. Surveys of conditions existing in a few of the older cities of the United States show that losses due to rats are almost in exact ratio to the population. There is an annual loss of $100,000,000 in grain actually eaten, over $200,000,000 damage to cereal crops and $600,000,000 loss to the poultry industry.

Three kinds of house rats occur in this country. The most formidable is the brown, or Norway Rat (so-called because it is believed that it originally migrated from Norway). It may be recognized by its large size, robust form, blunt head, short ears and the fact that its tail does not exceed the combined length of its body and head. The brown rat breeds on an average of five times in a season, bearing anywhere from 6 to 23 young in a litter. It is astounding to realize that allowing 8 young to a litter the increase from a single pair in a season may amount to 880. If we are to allow 6 to a litter, we find it would be possible in three years for a single pair to breed over 20,000,000.

A full grown buck (male) will weigh from 9 to 14 ounces. There is a case on record of a buck weighting 21 ounces, but this is unusual. The average length from the tip of nose to root of tail is approximately 9 to 11 inches. The tail is usually 6 to 8 inches in length. The cunning of the rat is evidenced by its mode of travel,—the tail is usually horizontally extended about one inch above the ground so as to leave no trail. The rat possesses a chisel-like pair of incisor teeth in each jaw, especially adapted for gnawing. These incisors are curved, the upper one slightly more so than the lower. Their growth being continuous, should anything prevent the normal wear by which their length is regulated, the unopposed incisor may gradually curve upon itself until a complete circle or more has been formed, the tooth sometimes passing through the animal's head. There are sixteen (16) teeth in all. The tongue is short and compressed, with a blunt tip which is never protruded beyond the incisors. The tail has 210 or more scales. Mice generally do not have more than 180 scales.

Mating Habits

THE oestrous cycle or "love period" of the rat lasts from three to four days. In only a few hours within this cycle will the female permit the amours of the male; at other times she avoids his attentions. During the receptive period her reactions to courtship change completely. When her suitor approaches, she often rears upon her

haunches, throws her paws up in a defensive attitude, closes her eyes and gives a characteristic short squeak. The male nervously licks her face, sniffs at her genitals and attempts to mount. The female coyly runs away only to return to the former trysting place. There are numerous unsuccessful attempts at copulation before the completed acts take place. The secretion of the male form a soft vaginal plug which quickly hardens, cementing the vagina shut and thus preventing the escape of the sperm until after fertilization of the eggs is accomplished. The vaginal plug is usually lost within 24 hours.

The sperm ascends the genital tracts within a few hours after copulation and fertilizes the eggs as they are shed from the follicles before they enter the uterus. The fertilized eggs descend into the uterus where they implant about the fifth day. About the eighth day, at a state corresponding to that of the three day chick, all the foetal organs are laid down. The young are born usually between the 19th and 21st day.

Just prior to parturition the female becomes restless. At the time of birth it retires to its nest for parturition; following birth, a careful washing and cuddling of the young will follow. Four or five minutes of uterine contraction may be required to give birth to each little one, followed within a minute by expulsion of the placenta and portions of the foetal membranes. The female will chew and occasionally devour the placenta.

The new born young generally remain motionless for as long as a minute, give a tiny gasp, then another. These gasps are continued at irregular intervals; within five minutes, regular breathing commences and there is an occasional twitching or sucking movement of the mouth. Nursing takes place as soon as the mother huddles over the young, the first period of nursing continuing as long as fifteen hours. On the third day, hair is visible. The retina develops after the fifth day and the eyes open in about 14 days. Sex maturity is usually reached in the second to third month.

Man versus Rat

FOR centuries, man has matched his wits against the cunning of the rat. Failure to exterminate can be invariably traced to inefficient methods and unsanitary conditions. The first step in rat extermination must be the removal of these conditions. They require food and shelter, and disappear when either of these is lacking. Rats migrate from places where food is scarce to places where it is plentiful. This accounts for the fact that while the pests may be comparatively scarce in a rural neighborhood, they suddenly become abundant and exceedingly destructive over large areas. They usually leave the cities and villages every Spring when mating occurs for river banks and farmsteads in the country; the return migration follows in the Autumn.

The most efficient means of destroying rats and the one most generally recommended is the use of prepared baits. While various poisons have been used in the past for this purpose, their use on a large scale has been restricted because of the danger to domestic animals, poultry and humans. The Pasteur Research Institute of France has created a toxic specific for rats and mice, harmless to man, domestic animals and poultry, establishing a more definite means for rodent control. The Pasteur specific is positive in its action, as little as two (2) grains kills the pests in 6 to 7 hours. It is repulsive and non-poisonous to all other forms of life. Cats and dogs, starved for three days, refused food diluted with the specific.

Keeps Rats from Food

THE natural focus of any rat is its preferred food. It may be in a granary, feed room, pantry, storage cellar, etc. Food shortages limit the number of rats infesting premises and automatically reduces their breeding habits. Starved rats are easily amenable to baits. A rat can live on bread and milk and multiply under any condition, but it is necessary to have a complex diet, otherwise its fertility and death rate are affected. To eliminate the rats' food supply, it is essential to store foodstuffs in rat-proof containers. Waste should go into tightly covered receptacles.

Rats and mice will eat almost any food that is acceptable to humans. Baits should always be fresh and preferably of good quality. It is interesting to observe that if rats discover an entrance into a meat market, they will usually attack the choicest parts of the meat, neglecting the coarser pieces. In dry weather, wet, mushy baits are much more effective, particularly if there are no nearby sources of water supply. The following baits are usually very attractive: *Meat*—hamburger, sausage, fish, liver, bacon or cheese; *Vegetables and Fruits*—thin slices of musk melon, apples, tomatoes, cucumbers, canned corn, squash, pumpkin seed, mashed banana, boiled carrots or baked sweet potatoes; *Cereals*—rolled oats, bread, corn meal, flour or cake.

Rats and mice seek food by smell. The taint of human odor is offensive to them and makes them unusually wary. It has been said on good authority that rodents will detect human odor as long as one week after the bait has been touched. More effective results are always possible by avoiding contact with baits. If gloves are used, it is wise to scent them with some strong smelling substance such as aniseed, caraway, etc. Success in poisoning depends largely upon the baits used and the method of distributing them. In this respect, it is

(*Turn to Page* 119)

Removing the Mystery from Fly Sprays

A New Insecticide Advertising Note is Sounded in an Interview with Charles F. Opitz

IN an advertising campaign which is shortly to be opened to the insecticide using public through the medium of twenty-one daily newspapers, street-car and subway car cards, counter displays, window strips and explanatory booklets, John Opitz Inc., New York manufacturer of insecticides, is trying out an entirely new idea in insecticide merchandising. The basic principle of the campaign is to give the public the plain truth about insecticides and their action.

Advertising campaigns heretofore have dramatized the use of insecticides or focussed public attention on the danger of insects, but none has as yet explained the workings of an insecticide or its proper application. One type of advertising, which has been too prevalent, is the use of broad and frequently exaggerated claims in advertising copy. Many manufacturers have resorted to this method of increasing sales, claiming without any particular proof, that their products are superior to all others in effectiveness. Claims have been made in some cases of extremely high percentage kills which entomologists know it is impossible to secure in actual use even with the most powerful insecticide which can be made.

The new campaign by Opitz breaks away from these old devices to attract the buyer, and sets out to acquaint the user of insecticides to some extent with the nature of the products and their effective insecticidal ingredients. The general theme of the campaign is built around reproductions of pyrethrum flowers in bloom, together with the phrase,—"This lovely flower kills flies and mosquitoes." It is further pointed out that the extract of pyrethrum flowers is the most effective and safest fly and mosquito exterminator known to

Pyrethrum, by name, makes its bow as a part of retail advertising copy for a fly spray. The idea of "this lovely flower" sounds a new note in fly spray advertising

science. By telling the public just what pyrethrum is, and how safely and effectively it acts, the advertiser hopes to dispel the cloud of mystery and misinformation which has always surrounded insecticides in the public mind. It is also hoped to remove the fear of danger in the use of insecticides which has been built up in the public mind by a succession of erroneous newspaper reports telling of deaths resulting from chance eating of "insect powder" or inhaling its "poisonous fumes."

THAT this education of the public is necessary seems certain to one encountering the almost complete lack of knowledge of the nature of insecticides on the part of those who dispense news throughout the country. One instance of this will serve to show the present situation. An *Associated Press* release appearing in the July 29th, 1931, edition of the *New York Times* reported the death of Walter L. Smith of Winter Haven, Fla., who, according to the report, died from "insect powder" poisoning after inhaling the "poisonous fumes" from the powder. What the writer referred to was, no doubt, some type of cyanide fumigant

HOLD Your Insecticide Trade

GIVE them more dead bugs per dollar! That's what they want. There's a specially adapted "killer" by FULD for every indoor or outdoor insect pest. Build your reputation and profits on these super-strength insecticides in any odor under

Your Own label

FULD BROS.

ALPINE CHEMICAL CO.
2310 FREDRICK AVENUE
BALTIMORE, MARYLAND

Presto Model 102 Spray Gun

Presto 102 Electric Spray Gun

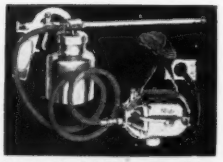
throws a ten foot cloud of penetrating mist—

INSECTICIDES and disinfectants correctly applied with the Presto spray gun are many times as effective and much more economical than the same material applied by old-fashioned methods. Give your customers this added advantage of proper methods of application and increase the sale of your product.

Presto spray equipment has proved a definite sales stimulant, especially effective with large users of insecticides, moth killers, deodorants, disinfectants and similar products.

Presto model 102 electric spray gun is the ideal equipment for correctly applying materials of this kind. The complete unit weighs only 3¾ lbs., is convenient and easy to handle, and gets maximum effect out of the material sprayed. This unit throws a penetrating, finely atomized mist a distance of ten feet—and is furnished complete, ready to operate by plugging into any convenient electric light socket.

Presto model 88-94 shoulder strap spraying unit is particularly adapted to industrial use and for dairies, packing houses, and anywhere that large areas and efficient, economical application is necessary.



Presto Model 88-94 Shoulder Strap Electric Spraying Unit

Find out how Presto spray guns can help the sale of your products. Send the coupon now.

METAL SPECIALTIES MFG. CO.
3200 Carroll Ave., at Kedzie Ave., Chicago, Ill.
Send full details of Presto spray gun features and sales plans.

*Name*_____

*Address*_____

*City*_____ *State*_____

S 4 Gray

Say you saw it in SOAP!

which kills insects through the liberation of the poisonous hydrocyanic acid gas. A protest was filed with the *Associated Press* against the mistaken use of the term "insect powder." No correction was made, however, and even if one had been made the belief would still have been firm in the minds of millions of readers throughout the country that "insect powder" and insecticides generally are deadly poisons and extremely danerous to use. The general acceptance of such an opinion can do more to hold back the sale of insecticides than any other factor.

The Opitz campaign seeks to remove this misapprehension and also plans to help dispel the air of mystery surrounding the use of insecticides, which has been handed on to the insecticide industry by the first users of these materials,—the exterminators. The latter have too long claimed secret ingredients and mysterious powers for the preparations they use and supply, a habit of the "secret formula" which has grown to be common in the exterminating business. This air of mystery has spread through the insecticide industry, it being the basis for the user's willingness to accept the fallacy of the extremely "poisonous" nature of all insecticides.

The makers of "J-O Fly Spray" believe that more can be accomplished in arousing the interest of users in their product by explaining the source of the killing ingredients than by surrounding it with an air of mystery. They point out that the user will be much more apt to have faith in the effectiveness of a product when she knows of what it consists, why it kills, and why it is non-poisonous and safe. What the results of the new campaign will be, are of course, as yet unknown, but those behind its adoption express great faith in the ability of the public to assimilate with interest a few of the basic facts behind the effective use of spray insecticides.

The psychological effect of "this lovely flower" in the advertising copy, accompanied by pictures of pyrethrum flowers which greatly resemble the American daisy, should be good. The idea that the killing power of the insecticides spray comes from a flower, and not from some product of chemical origin, and that the product is therefore that much safer to use, should help to reassure doubtful housewives. The use of a pleasant rose type odor in the spray itself adds that much to the general effect given by the "lovely flower" idea embodied in the advertising. A product of pleasant flower-like odor, derived from an extract of a flower, should certainly meet the ideas of the housewife for a spray to be used in and about living quarters.

A SECOND point in the campaign will be the avoidance of exaggerated claims and the absence of recommendation of any "all-purpose" insecticide. The makers of "J-O" point out that the public has lost faith in many insecticides because of the grossly exaggerated claims made for them. Accordingly, the company will recommend specific products for the various purposes rather than to offer a general insecticide and claim that it will be equally effective on all types of creeping and flying insects. By selling a specific product for each purpose, the makers aim to avoid the dissatisfaction with their products which some manufacturers of "all-purpose" insecticides have encountered.

Another point which will be stressed in "J-O Fly Spray" advertising copy will be the proper application of liquid insecticides. In many cases users have experienced poor results and consequent dissatisfaction with insecticides because of their own mistakes in application. The most common mistake is failure to use enough insecticide. Future "J-O" advertisements will warn users against this error.It is believed that this will lead not only to a higher original consumption of insecticides, but also to a future expansion in sales when users are shown how effective insecticides really can be when properly applied in sufficient quantity. Lower prices now prevailing

Design of car card, telling the salient facts about a fly spray and why it is made from an extract of pyrethrum. The "lovely flower" appeal is carried further by the pleasant rose type odor of the product

make this possible for users who were formerly apt to be sparing in their use of insecticide because of its high cost.

Orientation of the public in the nature and use of insecticides cannot help but be of assistance in promoting their sale. When the prospective user knows what an insecticide is, how it acts, how he should apply it, how much he should apply and what he may expect of it, he will be much more apt to consider its use. John Opitz Inc. believe that the buying public is coming of age,—that it is old enough to assimilate and appreciate good large doses of actual facts on the make-up and use of insecticides. The result of the campaign should be of benefit to the entire insecticide industry.

John Opitz, Inc., the house which is behind this new type insecticide advertising campaign, has been engaged in the manufacture of insect and rat exterminating products for the past 58 years, having been founded in 1874. Charles F. Opitz is the present head of the firm. The 1932 campaign was planned and worked out by Mr. Opitz in conjunction with the National Process Co., New York, which company designed and manufactured the window displays, car cards, and other advertising material.

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Four-amyl metacresol has a Rideal-Walker coefficient of 200-50 and is only half as toxic as hexylresorcinol. It is suitable for a mouth wash and inhalents. Vapor from small quantities on filter paper in the lids of Petri dishes quickly killed cultures of *Pneumococci, Staphylococci,* and other organisms at 37 deg.—*Jour. State Med,.* 39, 599, 1931; *Chem. Abstr.,* 26, 806.

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A compound for killing vermin is made from a mixture of carbon tetrachloride and chlorpicrin, ranging from 25% to 75% of either ingredient. It is atomized for use.—Austrian Patent No. 124,486.

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In the extraction of rotenone from derris and cube roots, carbon tetrachloride is a very effective solvent, being superior to ether in all respects. Rotenone is more readily soluble in carbon tetrachloride, is more readily separated by evaporation, this solvent giving quicker and more selective separation, and being without a fire hazard.—*Ind. & Eng. Chem.,* News Ed., 9,301, 1931.

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A mixture of naphthalene 94%, creosote 3%, and iodoform 3% is termed NCI. Its vapor is stated to be a powerful insecticide. It may be used in benzene or turpentine solution.—*Bulletin Hygiene,* 6,767, 1931.

Purchases for Standard Oil Co., of New York, Vacuum Oil Co., Socony-Vacuum, Inc., and Standard Vacuum Transportation Co., are now being made by the purchasing department of Socony-Vacuum Corp., 26 Broadway, New York.

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Fay Co., 130 Madison Ave., New York, manufacturers of floor machines, announce the development of a Jumbo model. The new machine, equipped with either ½ or ¾ horse power motor, weighs 120 to 135 pounds, the entire weight resting on the brush during operation. The new Jumbo is equipped with a device enabling the operator to distribute the solution wherever required for floor scrubbing. Attachments for waxing, polishing and sandpapering are also provided. With each machine the company supplies a wheel carriage.

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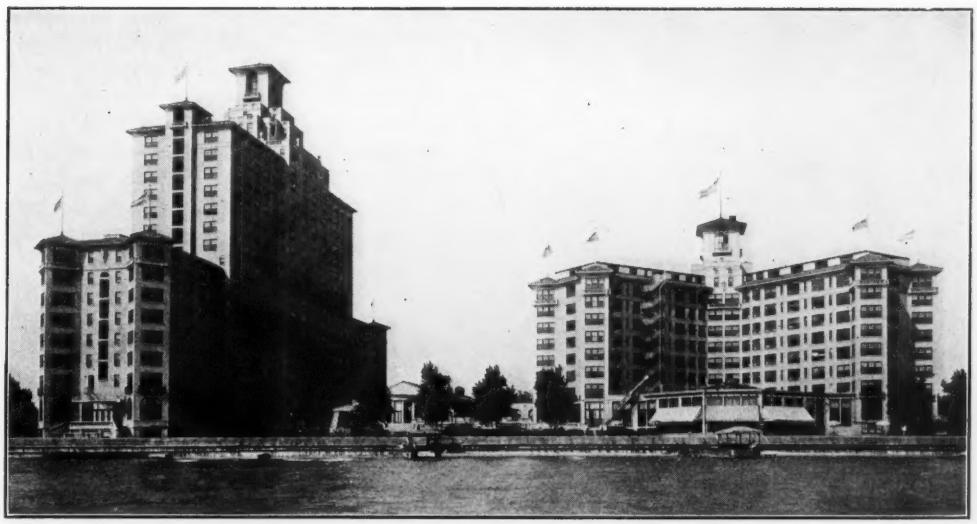
J. H. A. Fink, export manager of John Powell & Co., New York, has just returned from a business trip to Porto Rico.

New type containers which have recently been adopted by Stanco, Inc., and Furst-McNess Co. respectively for two well-known insecticide and disinfectant products. Containers manufactured by the St. Louis Can Co.



The Edgewater Beach Hotel, Chicago, will be the place of the annual mid-year meeting of the I. & D. M. A. on May 23 and 24 for the fifth consecutive year.

Insecticide And Disinfectant Mid-Year Meeting, Chicago, May 23-24

THE Eighteenth Annual Mid-Year Meeting of the Insecticide & Disinfectant Manufacturers Association will be held at the Edgewater Beach Hotel, Chicago, on Monday and Tuesday, May 23 and 24. This is the fifth consecutive year that the summer meeting will have been held at the Edgewater Beach Hotel. Although the meeting will start officially on Monday, May 23, there will be a combined meeting of the Board of Governors with committee chairmen at the hotel on Sunday evening at 7:00 P. M. A golf tournament has been planned for Sunday afternoon preceding the meeting. Those who will attend the convention are urged to arrange to arrive at the Edgewater Beach on Sunday morning.

The preliminary plans for the summer meeting call for papers and discussions mostly by the membership on internal problems of the insecticide and disinfectant industries, with the chief emphasis on the side of sales, credits, market conditions, distribution, and other commercial subjects. Walter J. Andree of Sinclair Refining Co. is chairman of the program committee. Suggestions from the membership for subjects to be added to the program for discussion should be sent to him promptly.

General convention arrangements are in the hands of Harry W. Cole of Baird & McGuire, Inc., secretary of the Association. He has announced that the lowest room rates ever offered by the hotel are available this year at three dollars for single rooms and five dollars per day for double rooms. The plans call for luncheons to be held daily at the hotel between morning and afternoon sessions. The mid-year dinner, which as usual will be strictly informal, will be held on the evening of the second day of the meeting at the hotel. An elaborate floor show is being planned by Grant A. Dorland, chairman of the entertainment committee. Mr. Dorland is also in charge of the golf tournament being planned for Sunday afternoon, May 22, and has requested those members and guests who intend to play, to write him indicating their intention. There will be an entry fee of probably five dollars for this event. The course tentatively selected is the Tam O'Shanter Country Club. Entry fee will include greens fee, transportation to and from the club, and a share for a number of handsome

prizes which will be available for both duffers and accomplished golfers.

In view of the fact that the last annual convention of the Association in New York broke all records for attendance, the convention committee in charge of Mr. Cole states that it expects the Chicago meeting this year to be the largest which the Association has ever held in the middle west. Further details of the meeting may be secured from Mr. Cole at Holbrook, Mass. Hotel reservations should be made well in advance for the best choice of rooms direct with the Edgewater Beach Hotel, Chicago, mentioning the Association meeting.

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Finding that domestic and foreign costs of production of creosote oil are closely comparable over the years, 1928, 1929 and 1930, the U. S. Tariff Commission in a report to Congress, March 25, recommended that no duty be applied on imports of creosote oil into United States. The average American production cost over the three year period was estimated at 13.01 cents per gallon, the British cost being figured at 13.47 per gallon.

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A distributor of metal polish has agreed to discontinue use of the words "Chromium" and "Kwickrome" in designating preparations that do not contain chromium. The Federal Trade Commission announces that the distributor will also cease use of the words "Plate" and "Plating" to designate a compound that is not a plating for other products.

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The Federal Food and Drug Administration is conducting a survey of premise disinfectants for farm use. Preliminary results show that where the possibility of contact with diseased animals exists, premise disinfectants are incapable of stopping the spread of disease. It is also noted that a disinfectant may be easily rendered inert by the presence of filth and dirt.

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S. Baum, New York manager for United Chemical & Drug Corp., has resigned this position and will join the staff of McKesson & Robbins, Inc., Bridgeport, with whom he was formerly associated. Irving Feinberg, president of United Chemical & Drug, announced recently that the New York office of the concern would be abandoned.

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National Sanitary Supply Association will hold its tenth annual meeting this year at the Hotel Statler in Detroit, on May 18th, 19th and 20th.

Dominion Tar & Chemical Co., Montreal, earned a net surplus of $2,954, in 1931, as against $464,243 in the previous year. A contributing factor in the decline in earnings was the retirement of bonds during the year, sinking fund operations of this nature totaling $106,000. In addition $50,300 worth of shares of Alberta Wood Preserving Co. were acquired.

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A British insecticide and three native brands, "Bekolit," "Unic" and "Ridol," dominate the Rio de Janeiro market, all being active competitors of the American brands offered in that territory.

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Derris grows wild in many parts of the Philippine Province of Cebu, although it is not cultivated commercially, according to a report by the Chemical Division of the U. S. Bureau of Foreign and Domestic Commerce, Washington.

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The Zonite Products Corporation's preliminary report for the year ended December 31, 1931, shows net income of $953,177 after expenses, taxes, etc., equal to $1.13 a share on 845,556 shares common versus $750,608 or 89 cents a share in 1930.

Clifton Markets New Moth Cake

Clifton Chemical Co., New York, is now marketing a new large size moth cake which retails at twenty-five cents for a four-ounce cake. The cake is attractively boxed in a container equipped with a hanging tab. Five colors and odors are available: red (oriental), yellow (cedar), pink (rose), purple (lilac), and green (mint). The cakes are exhibited on the retail counter on a practical display card which allows the customer to select the cake in the odor preferred. The cakes are packed for sale in boxes of two dozen, six boxes to the carton.

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For storing saponified cresol, galvanized drums or tanks are not superior to steel containers. Corrosion of the zinc may take place at minute faults in the galvanizing. Lead lined drums or tanks should be avoided completely for cresol compounds.—*Chem. & Druggist*, 116, 6, 1932.

The Rat and Its Extermination

(*From Page* 107)

fise to state that no exterminator can be better than the intelligence of the user. The all important requirement is to set out the kind of baits that the rats will eat. It should be kept in mind that rats are like humans in the respect that they will eat only foods that they find agreeable.

Distribution of Baits

PLACE baits in spots most frequented by the rats, especially where they have been seen feeding. Where rats are abundant, baits should be exposed at intervals of ten feet. If rats find the entrance into any room through several holes, it is wise to seal all but one, attracting them through this focal point and making it much easier to bait.

It is not necessary to place baits in front of holes, as they are often more effective when put in inconspicuous places. Rats do not like to eat out in the open and will as a rule carry food into their hiding places or behind obstructions where they are not exposed to view. Baits will always be taken when suspicion is allayed. Rats are extremely curious and more effective results are very often obtained by enclosing the baits in small paper sacks, closing them by twisting the tops. Be sure to expose a sufficient number of baits at one time, so that the greatest number of rats may be attracted, for rats that have seen their fellows sick and dying become suspicious and refuse for some time to touch other baits.

If enough are killed at one time, very often those remaining will leave the premises entirely. It is best to distribute baits in the evening so they will be fresh when the rats are feeding. Always destroy uneaten baits the following morning, taking note of those that have been eaten most freely. Continue to distribute fresh baits, repeating those that have proved most attractive.

In badly infested places, every available means should be used to rid the premises. Some of the methods used in wholesale rat extermination are: Trapping, snaring, trailing, flooding, digging, hunting, ferreting and fumigating. All of these destructive agencies have helped to keep down the surplus, but in spite of them, the total number of rats in the world has not been materially reduced. The actual destruction of rats is necessary as a temporary means of stopping their depredations, but modern construction and sanitation are the weapons that must be relied upon to gain permanent relief.

Continual rat killing is the only practical methods of control. Where constant, unsanitary conditions prevail, it is absolutely necessary that baiting continue at least once every two weeks, in spite of the seeming disappearance of the pests. An apparently successful baiting campaign may have rid the premises of adult rats without having any effect on the young that may have been too helpless to forage for food. Within a few weeks, a new assault commences by these hungry young, who begin to go for themselves. Systematic periodic baiting will help to catch all of them, before prolific breeding is permitted to swell their numbers.

Stone walls supporting embankments and driveways on sloping farmsteads, are most frequently infested. Wood piles, manure piles adjoining barns, hay and straw stacks, while they do not provide food, are attractive to rats for harbors only if near a source of food supply. Other favorite breeding places are hollow walls, grain bins, corn cribs, granaries, poultry houses, markets and warehouses.

Deodorants

THERE is always a possibility that a rat will die in an inaccessible damp place, where the body will decay and cause obnoxious odors. In such cases, the nuisance can be abated to some extent by the use of a deodorant that will absorb, neutralize, or destroy the offensive odors of putrefaction. If possible, a small hole should be bored through the wall in the vicinity of the supposed point of origin and several tablespoonsful of deodorant inserted, after which the hole may be plugged. Odors from dead rats seldom last longer than 4 to 5 days.

The war against the encroachment of the rat has been unceasing but without avail. There has been constant agitation for the passage of laws to effectively cope with the problem. Scientists have advanced many theories attempting to eliminate the prolific breeding and in this way, reduçe the constantly increasing hordes.

One of the most interesting of these calls for the adoption of a uniform, international law, that would make it illegal to kill any male rats over a period of time. Operating on the premise that an average of nine females are born to every five males, the object of rat catching should be the release of all males and the killing of all females. If this were done over a long period, the number of males would be far greater than the females. It is assumed that the law of nature would then intervene, the males harassing the dwindling females, eventually causing their death. The remaining males would then die of old age or be destroyed by natural enemies.

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The San Francisco offices of Anchor Cap & Closure Corp., and Capstan Glass Co., were moved to 230 California street, April 1. The new telephone number is Douglas 4319.

Magnus, Mabee & Reynard's catalog and price list for March and April, 1932, has just been issued.

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Testing Insecticides

(*From Page* 102)

ilarly, if one investigator uses a certain fraction of Pennsylvania Oil and another a different fraction of the same oil, they will obtain different results.

Griffin, Richardson and Burdette[2] have shown that the size droplet produced by a sprayer has a very marked effect upon the insecticidal activity of the same material. Droplets of 5 to 10 mu produce about the maximum effect whereas droplets of 2 mu and smaller decrease the activity of the insecticide. These conclusions were based upon a study of contact sprays and insofar as the insecticide serves as a contact poison, they will apply to it. If, on the other hand, the insecticide functions in the vapor phase, the rate of evaporation will increase as the droplet size decreases and the reverse conclusion must be drawn. There are two ways of producing these variations in droplet size. One is by changing the type of atomizer or spray and the other by changing the pressure on the same sprayer. Since it is probable that the majority of tests will be made using the same sprayer, the variable which must be controlled is pressure.

By air conditions is meant whether the air is fresh or exhausted but this factor can probably be ignored because the chamber is always aired between tests.

The importance of the angle of the spray is closely related to spray concentration. If the spray enters the chamber from all directions there is much more uniform dispersion of the material under study. Also, of course, this factor is of importance if the spray comes in contact with the insects. If the material being examined is heavy and is sprayed downward upon the fly it is possible that its wings will shield its body or perhaps it would be more correct to say that if the spray were directed upward against the fly there would be greater likelihood of its coming in contact with the more vital parts of the insect.

Condition of the insect is one of the most important factors to be considered. It requires no elaboration to point out that an old fly or a vitiated fly or a very young fly or a fly in any way enfeebled will be more susceptible to the action of any toxic material than will a strong healthy individual.

The method of testing which this paper wishes to advocate is as follows:

Chamber: All fly tests should be carried out under conditions which at least approximate those existing in the fly's normal environment and for this purpose a chamber of sufficient size to enable the fly to move about freely and approximately as unrestrictedly as it normally would should be provided. A very satisfactory size has been found to be a 6 x 6 x 6 foot cube. In the studies upon which this paper is based, this chamber was made of wood with the bracing members on the outside, leaving the inside as free from projections, corners, ledges, etc., as possible. The inner surfaces were originally well painted with white enamel in order to prevent absorption, by the wood, of material being tested. This paint, however, adsorbed and absorbed a certain proportion of the oily materials being studied and, although it was carefully wiped out after each test, it was impossible to remove all traces of the preceding materials. Accordingly, the inside, including floor and ceiling, was lined with transite board, an asbestos composition, all corners were sealed with a Silex-sodium silicate cement and the walls were rendered as nearly non-absorbent to oils as possible by painting with sodium silicate. In the center of the ceiling a glass window was set with a light bulb above it for illumination. A tight closing door, large enough for a man to enter, was set in one wall and the adjoining walls were provided with glass windows in the center of each. These same walls each had four square ports 6 x 6 inches covered with wire gauze and provided with tight fitting hatches. Each wall had two one-half inch holes bored through it six inches from the ceiling and closed by corks.

Procedure: Each test was run upon a considerable number of flies, 5 days of age, never less than 100 and usually rather more but not exceeding about one per cubic foot. These were liberated in the chamber, which was kept at 85° F., and the insecticide was introduced through the one-half inch holes along the ceiling by means of a modified Devilbiss atomizer No. 152 with No. 631 cut-off.

The modification consisted in replacing the reservoir of the atomizer by a narrow 20 cc. cylinder made by cutting off an ordinary burette and sealing one end and in substituting a sufficiently long outlet tube to reach practically to the bottom of the cylinder, for the shorter one which is standard equipment.

By filling the atomizer above the lower end of the outlet tube and spraying until no more spray is delivered when the burette tube is in a vertical position, the zero point of the graduated atomizer is determined. If 12 cc. of insecticide is now added above this zero figure, the atomizer will deliver exactly 12 cc. before it returns to its zero and ceases to deliver. The accuracy of this equipment is about 0.1 cc.

This atomizer was operated at 12½ pounds pressure from a constant pressure airline controlled by a Hoke reducing valve. The amount of solution used in each test was 12 cc. and this was sprayed in about equal quantities through each top hole. The door and all ports were, of course, tightly closed during this procedure. The chamber was kept closed for ten minutes, during which time observations on the flies could be made through the windows to study the manner in which the material being tested was affecting them. At the end of ten minutes the square ports were all opened, a Buffalo exhaust fan turned on, and the number of flies still clinging to the walls and ceiling was counted through the side windows. The flies which had dropped were carefully gathered up and transferred to clean observation cages in which food and cotton gauze soaked in water had been placed. These cages had wooden bases 6 inches square, wire gauze back and sides and a sliding glass front.

It was considered that the flies still off the floor had escaped the action of the insecticide. The flies in their gauze cages were kept for twenty-four hours to observe whether there was ultimate recovery or death. At the end of this period, these insects were counted and the number still alive added to those which had been on the walls on the chamber. The Buffalo exhaust fan swept out the chamber by sucking air through it and afterward the floor and walls were thoroughly wiped off with an absorbent cloth.

The number of flies still off the floor at the end of the ten minute period divided by the total number liberated in the chamber gives the "knock-down in 10 minutes." The number lying dead in the observation cages after 24 hours divided by the total number originally taken gives the "percentage kill."

The variables thus far held in control are time, temperature, spray concentration, pressure in spray, air conditions, angle of spray, and kind of insect. The condition of the insect is more particularly dependent upon how it has been bred and this phase of the problem is discussed in the first part of this paper.

Tests conducted following this procedure show a low average variation and it is entirely reasonable to presume that any investigator could obtain very uniform results following the method.

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[2] Griffin, Richardson & Burdette. Relation of Size of Oil Drops to Toxicity of Petroleum-Oil Emulsions to Aphids. Jour. of Agri. Research, Vol. 34, Pages 727-738.